# IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication JUNE 15, 1961

★ Sen. McClellan and Senate Experts to Decide—

## Who Gets Patents When U. S. Pays for R&D p. 73

Farm Equipment: A Good Year? p. 78

Cold Extrusions Forge Ahead p. 103

Digest of the Week p. 2-3

# controlled microstructure eliminates extra finishing

High production items like these wrench sockets require steel of uniform chemistry, structure and hardness. SNAP-ON TOOLS CORPORATION specifies Aristoloy 8630. They report that uniform quality and predictable machinability mean less down-time for tool changes and the elimination of extra finishing operations.

Aristoloy *electric furnace* steels are no accident. They result from controlled melting of selected scrap, careful rolling, and precise heat treating. Bars and billets produced are of controlled hardness and microstructure.

Call your local Copperweld representative for complete information—or write for PRODUCTS and FACILITIES CATALOG.

ARISTOLOY STEELS

DIVISION OF
**COPPERWELD**
**STEEL COMPANY**

ARISTOLOY STEEL DIVISION 4001 Mahoning Ave., Warren, Ohio • EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N. Y.

# METALLURGICAL ADVICE ON STEEL WIRE . . .

## *right in your plant*

Steel

*for Strength*
*. . . Economy*
*. . . Versatility*

Even before you place your order, one of our metallurgists will sit down with your engineers to find out what it is you want the wire to do. He'll work with them to determine the right wire for the application—whether you cold-head or coil . . . weave or weld. It's all a part of your Bethlehem order.

And if you're just starting a production run with Bethlehem wire, you can have one of our metallurgical engineers "at your elbow" to advise you. He'll bring his wire experience right into your plant—at no obligation to you. Just call the nearest Bethlehem sales office, or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, Bethlehem, Pa. *Export Sales:* Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**

BETHLEHEM STEEL

**THE IRON AGE, Chestnut & 56th Sts.**
**Philadelphia 39, Pa., SH 8-2000**

# IRON AGE

June 15, 1961—Vol. 187, No. 24

*GEORGE T. HOOK, Publisher*
*TOM C. CAMPBELL, Editor-In-Chief*
*GEORGE F. SULLIVAN, Editor*
*E. C. BEAUDET, Managing Editor*

*News Editor* — *R. D. Raddant*
*Technical Editor* — *J. J. Obrzut*
*Art Director* — *T. S. Peaby*

**News Staff:** *H. R. Neal, Asst. News Editor; P. J. Cathey, J. D. Baxter, B. F. Surer, G. A. Mulligan, Associate Editors.*

**Technical Staff:** *R. H. Eshelman, Machinery Editor; R. R. Irving, Welding Editor; C. L. Kobrin, Metallurgical Editor; W. N. Redstreake, R. J. Radomski, Associate Editors; C. A. Lewis, Assistant Editor.*

**Iron Age Bureaus:** *K. W. Bennett, Chicago; T. M. Rohan, Cleveland; G. J. McManus, Pittsburgh; A. E. Fleming, Detroit; F. J. Starin—Nonferrous, New York; R. R. Kay, Los Angeles; G. H. Baker, R. W. Crosby, Washington.*

**Correspondents:** *F. L. Allen, Birmingham; N. Levenson, Boston; R. E. Koebbe, St. Louis; J. Miller, San Francisco; Scott Hayden, Buffalo; D. R. Coughlin, Seattle; A. T. Collins, Houston; F. Sanderson, Toronto; F. H. Harley, London.*

*Washington Editorial Office: Nat'l. Press Bldg. Washington 4 ..... EXecutive 3-3474*

**Business Staff:**

*Marketing Manager* — *R. H. Groves*
*Circulation Manager* — *W. M. Coffey*
*Production Manager* — *Warren Owens*
*Promotion Manager* — *D. B. Pollock*
*Market Research Manager* — *G. V. Shanno*
*Census Manager* — *William Laimbeer*
*Research Consultant* — *Oliver Johnson*

**Regional Business Managers**
**Denotes editorial office also*

*Atlanta ..... J. W. Sangston*
*1776 Peachtree St., N. W. — 875-1255*
**Chicago 1 ..... T. H. Barry, W. R. Pankow*
*360 N. Michigan Ave. — RAndolph 6-2166*
**Cleveland 15 ..... C. B. Shaw, R. L. White, W. J. Devlin*
*930 B. F. Keith Bldg. — SUperior 1-2860*
*Columbus 15, Ohio ..... Harry G. Mumm*
*LeVeque-Lincoln Tower — CApital 1-3764*
*Dallas 6 ..... W. J. Smyth*
*189 Meadows Bldg. — EMerson 8-4751*
**Detroit 2 ..... W. J. Mulder*
*103 Pallister Ave. — TRinity 1-3120*
**Los Angeles ..... R. Raymond Kay*
*3320 Strand, Manhattan Beach — SPring 2-1819*
**New York 17 ..... C. T. Post, I. E. Hand*
*100 E. 42nd St. — OXford 7-3400*
**Philadelphia 39 ..... SHerwood 8-2000*
*B. L. Herman, J. A. Crites, W. E. Carr*
**Pittsburgh 19 ..... T. M. Fallon*
*1707 Frick Annex Bldg. — ATlanta 1-1830*
*San Francisco 3 ..... Don May*
*1355 Market St. — UNderhill 1-1707*
*W. Hartford 7 ..... Paul Bachman*
*62 LaSalle Rd. — ADams 6-4237*
*London, SW 1 ..... A. T. Chapman-Purchas*
*67/68 Jermyn St. — St. James, TR 6318*
*Dusseldorf ..... M. F. Holsinger*
*Huttenstrasse, 17 — Am Ernst-Reuter Pl*
*Classified Adv. Sales — H. W. Bozarth*
*Philadelphia 39 — SHerwood 8-2000*
*J. H. Kofron — Chilton Research Director*
*Robert Gunning — Readability Consultant*

**Chilton Officers & Directors**
*G. C. Buzby, President*

*Vice-Presidents: P. M. Fahrendorf, L. V. Rowlands, G. T. Hook, R. E. McKenna; Treasurer: W. H. Vallar; Secretary: J. A. Montgomery; Directors: M. E. Cox, F. P. Tighe, E. B. Terhune, Jr., R. W. Case, Jr., C. A. S. Heinle, J. H. Kofron, G. E. Cameron. Comptroller, Stanley Appleby; Ass't. Sec'y., I. C. Holloway*

*Indexed in Applied Science & Technology Index and Engineering Index*

*Copyright 1961 by Chilton Company*

BPA NBP

The IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts., Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only, $2 for 1 year, $3 for 2 years in U.S., Canada $10, all others $15 for one year. Latin America $25. Other foreign $35. Single copies 50¢. Annual Issue $2. Cable: Chilton Philadelphia.

## Digest of the Week in Metalworking

### News of the Industry

**Patent Hearings Flash Warning:** Industry's rights are at stake. 73
**Plastics Makers Expect Sales Boom:** Attractive prices, new uses help. 75
**Will Appliance Sales Top '60 Levels?:** Outlook for second half good. 76
**Taxes on Overseas Profits Reviewed:** Industry opposes President's plan. 77
**Farm Equipment Outlook Strengthens:** Sales gains are expected. 78
**Nuclear Men Study Safety Problems:** Costs are an important factor. 79
**W. German Steel Expansion Slows Down:** Supply-demand gap closing. 80

### Engineering-Production Developments

**A Challenge to Chip-Forming Methods?:** Cold extrusions forge ahead. 103
**Tungsten Lubricates Punch:** New tool steel develops slippery surface. 106
**Composite Molds Automate Casting:** Ceramic facing covers sand body. 108
**Strong Adhesives Bond Metals:** Many design factors affect joints. 110
**Shaver Skins Rod Quickly:** Removes surface defects at 130-fpm rates. 113
**When You Need Special Fasteners:** Check three cost-saving methods. 114
**Cleaner Chrome Boon to Melters:** Cuts silicon and carbon problems. 116

### Markets and Price Trends

**Steel Summary:** Customers get price concessions from steelmakers. 153
**Nonferrous:** Do high tin prices mean coming shortage of supply? 160
**Greater Status for Purchasers:** Materials management gains stature. 154
**Ford Develops Small V-8 Engine:** It will go in new, small Ford. 89
**Can Computers Solve Production Problems?:** Tool builders encouraged. 93

#### Editorial

Steel Prices:
Are They Fish or Fowl? 5

#### Metalworking Newsfront

Business Forecast 7
Metalworking Labor 9
Washington 11
International 13
Techfront 15
Market-Planning Digest 71
Report to Management 87
Spacefront 101
Steel Summary 153

#### Industry Trends

Automotive 89
West Coast 91
Machine Tools 93
Purchasing 154

#### Markets and Prices

Price Section 153
Steel Products 156
Ferrous Scrap 158
Nonferrous 160

#### Departments

Letters 19
Fatigue Cracks 21
Meetings and Exhibits 23
Industrial Briefs 84
Men in Metalworking 95
Technical Literature 119
New Patents 121
Design Digest 122
New Equipment 132
New Books 150
Clearing House 170

**ADVERTISING INDEX** 175

# Special This Week

## Patent Reform: Is It Needed?

Patent hearings conducted by Sen. John L. McClellan are not expected to bring any changes in patent laws until the next session of Congress. But the lawmaker promises that changes will be made. And there is a good chance that industry will lose its rights to patents developed under Federal R&D contracts. p. 73

## New Records for Farm Equipment?

Manufacturers of farm equipment are looking for 1961 sales to top last year's level. And, they say, 1962 might possibly bring a new record. The reason for this optimism is large gains in the gross income of U.S. farms, with more spending. p. 78

## How to Extrude Cold-Steel Parts

For generations, one of man's dreams has been to form cold steel as easily as you shape a piece of putty. Thanks to the cold-extrusion process, this dream is now a reality. Despite stiff competition, cold forging has found its niche in metalworking. p. 103

## Next Week

## Materials for the Nation's Future

Next week's special report starts a new series on Metalworking's Technological Explosion. This first four-color report will cover Materials for the Future. By 1970, materials will no longer be classified as metals, glasses and polymers.

**Shopworn. That's how technical data gets when it speaks with authority.**

By providing our customers with material that's sure to get shopworn, we help them get the most out of their machine tool investment. Ask the Field Engineer for a list of our publications. The **Warner & Swasey** Company, Cleveland.

W
S

# Steel Prices: Are They Fish Or Fowl?

Steel sales vice-presidents are having a tough time. Not because they don't have the orders. They are worrying because they're not sure if —or where—the next price cut might occur.

Purchasing vice-presidents are also worried. They are on the hot seat because they don't know if there are concessions floating around. It is their job to know—and if there are concessions they are supposed to take advantage of them.

Finance vice-presidents in steel are probably beside themselves. With labor costs going up and all the hubbub about the need for higher prices, they hardly think the stuff should be given away. It is embarrassing, too, to make a speech advocating higher steel prices while price cutting is breaking out around them.

So far the price weakness has not spread to major steel items such as sheets, strip, wire, bars, structurals and many types of pipe and tubes. In some of these areas there has been some overgrading. But that is hard to prove.

Yet, if the new crop of salesmen coming up thinks it can keep secret what it does pricewise it has a lot to learn. It takes about an hour to get wind of something fishy in the air. Both buyers and other sellers catch on fast—and meet the situation.

There probably are some cases where clarification or adjustment—which nevertheless turn out to be price cuts—were needed. At least that is the "explanation" for some of the recent price reductions. It is probably true, too, that with business so poor for so long and with capacity so great there were bound to be those who think they can snag new business by the cut price route—for awhile at least.

Yet, if a steel price increase is to become a market fact, it won't see the light of day under present conditions—a market where steel men are looking with uneasy suspicion at each other.

Even the government is in the act. The Administration is going to set its weight against any steel price increase. But that is academic until the present jitteriness calms down.

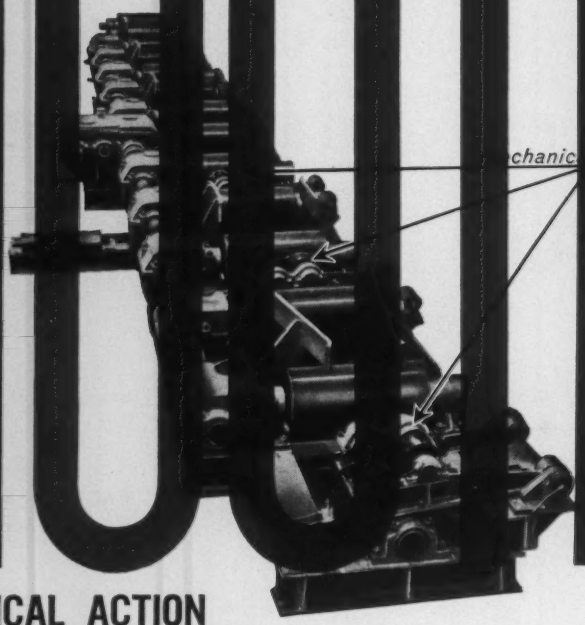
One thing is sure: A strong steel industry cannot emerge from an idiotic and costly wave of price cuts. That doesn't seem imminent but it could happen. If it ever does, it will mean that the nation's most basic industry has fallen flat on its face—in more ways than one.

Tom Campbell

Editor-in-Chief

**TREADWELL ENGINEERS**

# SMOOTH




## EFFORTLESS MECHANICAL ACTION TO SPEED STRAIGHTENING OPERATION

The heart of this hydraulic straightener operation is Treadwell's roller table with its turning mechanism. Motor driven lift rollers, normally recessed under the table rollers, raise and rotate the round above the table, so that the operator can freely turn the round on its axis to determine easily whether further straightening is required.

*Treadwell, specialists in the design and production of rolling mill machinery, guarantee you GOOD SERVICE, MODERN FACILITIES, and TOPNOTCH ENGINEERING. Try us.*

TE TREADWELL ENGINEERING COMPANY · EASTON, PA.

**SALES OFFICES:**
1015 FARMERS BANK BLDG., PITTSBURGH 22, PA., ATlantic 1-2883
208 S. LA SALLE STREET, CHICAGO 4, ILL., CEntral 6-9784

**STEEL MILL EQUIPMENT**

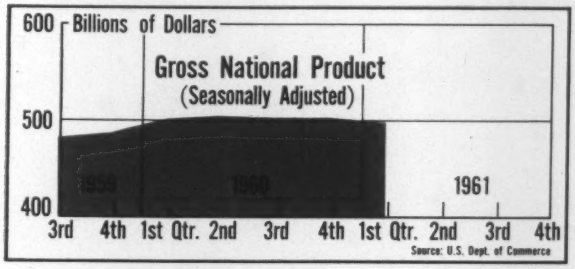
Manipulators, Mill, etc.
Mills, Billet, Merchant & Bar
Mills, Rod
Mills, Vertical Edging
Mill Repeaters
Coilers & Reels
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers
Conveyors, Coil
Drivers & Pinions
Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

**SPECIAL MACHINERY**

**CASTINGS — Electric Furnace Steel, Ductile Iron, Gray Iron and Ni-Hard**

## GNP Set For Steady Upswing

Companies which find their own fortunes well in line with the GNP level and direction can take heart. Here




are the best guesses from the economic front on just where GNP will be in the future.

The current quarter should see a $510 billion mark, up from $499.8 billion in the first quarter. What is expected to spark this jump is now-spreading inventory build-up.

And for the year, a $530 billion GNP is forecast. This is the shared view of Commerce Dept. Secretary, Luther H. Hodges, and Presidential economic adviser, Walter H. Heller. Their forecast is based on the broad recovery now in motion.

## Quicker Pace Due For Business

The improvement in business has progressed about the way most of the middle-of-the-road economists predicted—not too fast and yet not too slow. The size of the summer letdown will determine whether or not there is to be a swift uptrend later in the year.

But most analysts believe that the semi-boom or "boomlet" pace will hit the business front early next year. That is the time when some look for government controls to be approached—if things get out of hand.

## Prices Hold, Except Used Cars

The stability of the Labor Dept.'s consumer price index hides at least one price upheaval. April was the third straight month the index remained at 127.5.

Within the structure of the index were balancing up and down price movements. But the big news is a record-breaking jump in used car prices, up 6.8 pct from March.

The market can probably bear these prices. Dealer used car stocks were at a 35-day supply on March 1. As of mid-May, stocks stood at a 27-day supply.

No one quite believes dealers are about to price themselves into trouble. But used car prices are now key ones to keep an eye on in the near future. Auto sales experts remind that each new car sold requires the disposal of two used cars.

## Capital Spending Due To Rise

Capital spending by business is expected to hit a seasonally adjusted annual rate of $34.5 billion in the third quarter of this year. This is based on a survey of business made by the Commerce Dept. and the Securities and Exchange Commission in late April and May. First quarter spending was at a $33.8 billion rate.

Anticipated capital spending for the year is expected to be $34.46 billion. This is 3 pct less than actually spent in 1960.

But as often happens, the story here is behind the figures. In late April and May, when the latest survey was made, businessmen were still recession-shy.

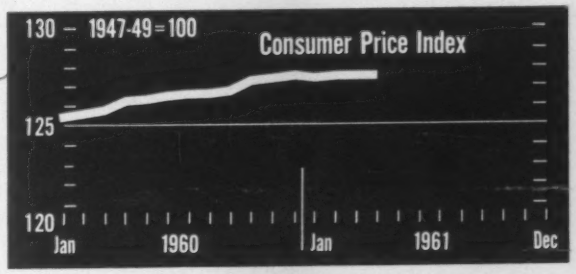
Actually, present and developing business fully supports a higher capital spending rate than indicated by the survey. Sights will be raised in the next one.

## No Zip In Consumer Buying

One thing needed for sustained drive in the recovery is active and rising consumer buying. So far, at least, this is missing. While most indicators rose in April, retail sales went down.

Another important element of consumer buying, housing, also lags.

Even in rising auto sales, there is a deflater. The

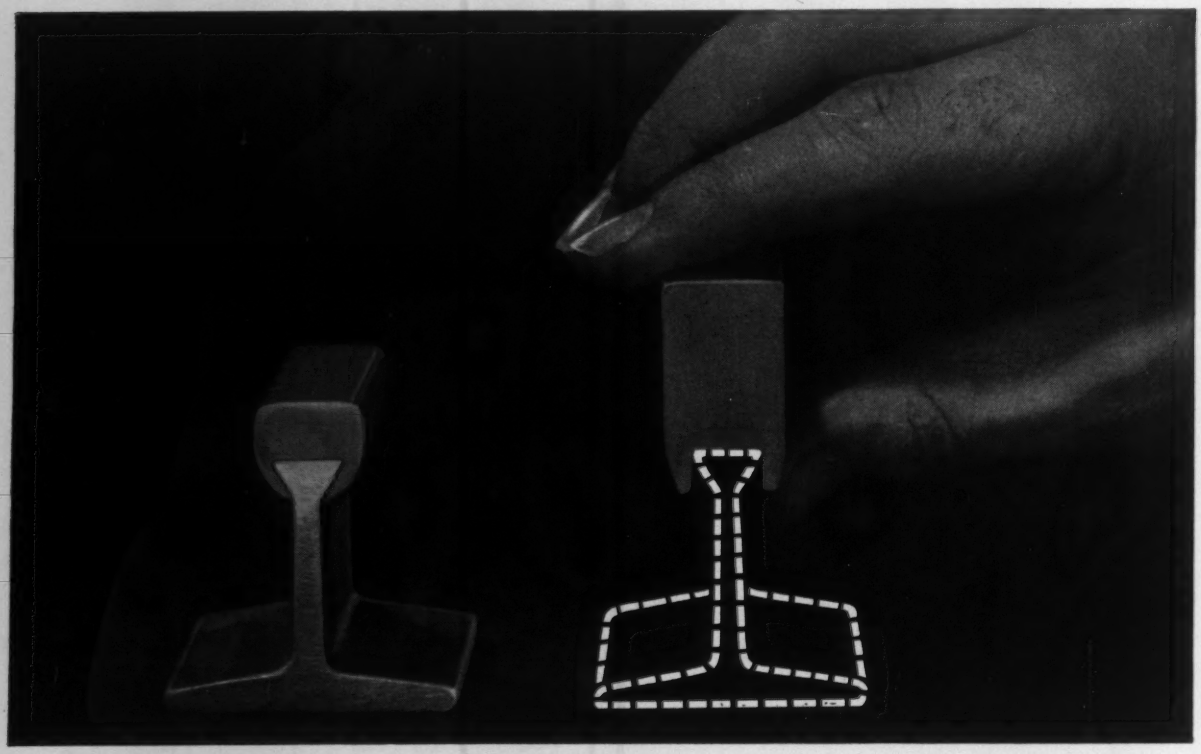



April consumer price index shows lower new car prices than in March. This largely reflects the public's buying of compact economy cars, now 35 pct of auto sales.

And worse, consumers in April reported fewer plans in the next six months to buy most types of durable goods than they did at the same time last year. This was the finding of a Federal Reserve Board survey.

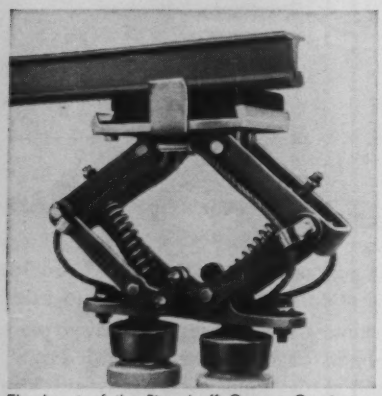
There is a clear message to industry in this lag. Mr. Consumer is not being automatically swept along in the recovery. He needs more "encouragement" to buy.

# COPPER FOR CONDUCTIVITY TEAMS UP WITH STEEL FOR STRENGTH



## ...in a compact, low-maintenance conductor system for heavy-current industrial applications

The copper-headed steel conductor rails, shown above, of the Ringsdorff Carbon Corp., East McKeesport, Pa., help provide many economies in conductor systems for such heavy-current users as traveling cranes, ore bridges, monorails—using either a-c or d-c.



The heart of the Ringsdorff Current Conductor System—the copper-headed steel conductor rail and pantograph current collector with a graphite carbon shoe. Components, including rail hangers and joints, are available in a wide variety of sizes, with capacities up to 2000 amps, for either a-c or d-c systems.

The system is simple and compact. One basic steel shape provides strength and simplifies installation. Over it is cold drawn the copper head of extruded Anaconda ETP Copper-100, in the size to meet individual current requirements. (Copper-headed conductor rail, left, 500 amps; right, 1500 amps.) Less space is needed; installation is easier than with aluminum rails.

Long life and low maintenance. The special Ringsdorff carbon graphite used in sliding contacts has an affinity to copper, putting down a film that lubricates its passage and protects the rails. Wear on the copper head is negligible over periods of 20 to 25 years. Only maintenance is replacement of carbon shoes, having an average life up to 3 years. Aluminum rails must be protected by lubrication or they will wear and pit—when out of use for a period may develop an insulating oxide film.

This is another illustration of the way the unique properties of copper are being utilized in industry to do things better—at lower cost. Anaconda has teams of specialists available to sit down with members of your organization to help select the alloys and forms of metal to solve your value analysis problems. For such technical help, see your Anaconda representative, or write: Anaconda American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario. 6147

**ANACONDA®**

**COPPER BRASS BRONZE NICKEL SILVER MILL PRODUCTS**

*Anaconda American Brass Company*

## UAW: Joy in Defeat Of Jobless Pay Hike

Michigan's Democratic Governor John Swainson vetoed a bill that would have boosted the state's unemployment compensation. It would also have raised taxes for employers.

The unions are happy, especially the UAW. Employers are unhappy, especially the automakers.

The unions would like higher jobless pay for laid-off workers. And employers aren't anxious to pay higher taxes.

But—the bill would have voided a 1959 decision of the Michigan Supreme Court which said workers in Michigan could collect jobless pay if they are idled by a strike by workers at another plant of the same company located in a different state (IA—Aug. 6, '59, p. 46).

Companies with multi-plant operations, such as the automakers, point out that this decision in effect forces a company to support a strike against itself.

## Wages and Prices

Industry price and wage policies may get a going-over from President Kennedy's Labor-Management Advisory Committee.

The topic is on the committee's next agenda, the meeting to be held July 10-11. This will be just two weeks after auto contract talks open.

However, the decision is apparently in line with Administration action on pricing policies. Steel industry prices are being studied to see if a price increase is justified for that industry.

## IUE: Pact Ends Strike Threat at RCA Plants

Radio Corporation of America and the IUE narrowly averted a strike by signing a new four-year contract. It calls for pay hikes of 2.5 pct retroactive to May 29, plus similar boosts in 1962 and 1963. Wages and "economic issues" will be negotiated for the last year of the contract.

Fringe benefit changes include improvements in the RCA retirement plan, and hospitalization and surgical insurance plans. Free hospitalization and surgical insurance will be provided for retirees with 15 or more years service, plus an extended medical care insurance.

## AWA: Foregoes Wage Hike in Cleveland

Aircraft Workers Alliance withdrew its request for wage talks with Thompson Ramo Wooldridge, Inc. The union represents 6700 workers at three Cleveland plants.

TRW had asked the independent union not to press for higher wages now. It said profits had dropped and business competition was a great threat.

The union agreed, but said it was a "difficult and trying decision."

## UAW: Improvement Factor?

The sparring between the automotive Big Three and the United Auto Workers has started.

General Motors Corp., Ford Motor Co., and Chrysler Corp. each by-passed the automatic annual "improvement factor" wage hike for 140,000 salaried employees. Since first made a part of the UAW's contract with GM in 1948, it has also been granted to salaried workers — usually about now. It amounts to 6¢ an hour or 2.5 pct, whichever is higher.

The move could mean two things:

**Automakers hope to kill-off the improvement factor raises and cost-of-living adjustments in contract negotiations which start June 28.**

**Or they don't want to set a floor under wage hikes. The union stand would then be: "We know we can get the improvement factor, but we want more."**

Support for the first reason stems from the fact that General Electric Co. and Westinghouse Electric Corp. knocked both features out of their contracts with the International Union of Electrical Workers last year.

Support for the second reason is based on the premise that the auto companies could grant the pay hikes to salaried workers retroactive from the time they settle with union workers.

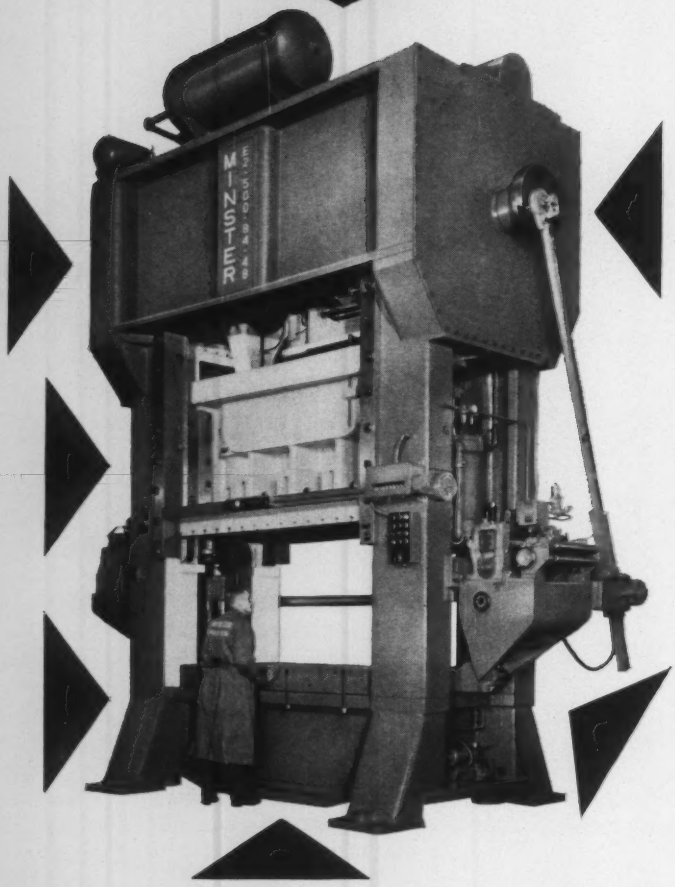
Another issue has stormed around Detroit and will get a further going over in the formal talks. The UAW wants a voice in selecting the sites of new auto plants.

Principal target is Ford. Since 1947 it has opened 15 new parts depots, 20 manufacturing plants and 11 assembly plants in the U. S. It closed eight others.

**Says UAW Ford Dept. director Kenneth Bannon: "We'd prefer them to be located where Ford workers are unemployed."**

**Ford says it intends to stress "management's unqualified right to manage without union restrictions."**

# HIDDEN STRENGTHS and VALUES




There are many points of superiority in a Minster E-2 Heavy Duty Blanking and Progressive Die press . . . most of which are not immediately obvious at a glance. You might call them "hidden strengths and values." For example, the speed possibilities, the full eccentric shaft . . . the unique frame design.

If you buy with an eye to better all around performance, take a close look at the Minster E-2. 200 to 800 tons.
**The Minster Machine Company, Minster, Ohio**

# MINSTER®

# ★Limited-War Arming Sought

The rebirth of the limited-war concept will mean much to defense contractors. Government contracts for conventional fighting equipment, which had been giving way to space-age weapons, will begin growing again.

**Conventional tanks, planes, ships, and modernized vehicles for a mobile armed force are strategic parts of the limited war concept. One of its key features is heavy armor protection.**

President Kennedy is asking Congress for an additional $100 million to begin buying new equipment for this mobile armed force next year. He says: "New helicopters, new armored personnel carriers, and new howitzers, for example, must be obtained now."

The Pentagon already has transformed the President's words into a plan. Though much of it is classified, here's an idea of what each of the services expects next year for conventional weapons:

**The Army** — Plans to increase non-nuclear limited-war research and development $46 million in 1962 are in the works. Included is more money for ordnance combat vehicles and related equipment. Guerilla warfare will mean a new emphasis on armor, though weapons and vehicles to be used are secret.

**The Navy**—"Our program is directed toward the improvement of versatile strike capabilities," Navy planners say. "It primarily supports improving Navy and Marine non-nuclear limited-war capabilities." The Navy program takes in aircraft, aircraft weapons and equipment, and amphibious warfare weapons and systems including surface strike weapons.

**The Air Force**—With additional funds suggested by the President, a total of $280 million is sought. The money will go for such things as airlift and conventional ammunition.

## ■ Price-Fixing Tip: Act More, Talk Less

The main result of the five-week investigation of electrical equipment industry price-fixing is a suggestion to top company executives.

The advice is: Act more, talk less. But if you have to talk, talk tough.

Sen. Estes Kefauver, whose Senate antitrust subcommittee made the investigation, called on corporation leaders to start digging out price fixers and stop relying on "don't do it" memos.

Commerce Secretary Luther Hodges, last witness at the hearings, called "the lack of communication" one of the "great failures" of big business. He called for "a more agressive program" in industry for acquainting low men on the corporate ladder with company policy.

## ■ Govt. Says No New Price Controls

The Administration is trying to take the curse off its meddling-in-industry pricing policies. It says it won't use direct controls over companies.

Walter W. Heller, chairman of the Council of Economic Advisers, says that though the administration is concerned about possible price increases, it is opposed to use of direct price controls in peace time.

Heller's group is now studying steel industry prices to determine if there is any justification for a price increase (IA, June 8, '61, P. 63).

## ■ Military Gets $12 Billion More

More than $12 billion is destined to be added to military buying power next year. Congress is about to pass a procurement bill authorizing some $12.5 billion for aircraft, ships, and missiles.

Included will be $252 million for more long-range bombers. Other weapons include one nuclear and four conventional fighting ships; 10 Polaris submarines; three nuclear-powered non-Polaris-type subs; and the Atlas, Minuteman, Titan and other Air Force missiles.

## ■ Congress Bores In On Agencies' Shift

President Kennedy's plan to reorganize the Federal regulatory agencies is coming under rising Congressional fire. But the question is, will the fire be heavy enough to veto it?

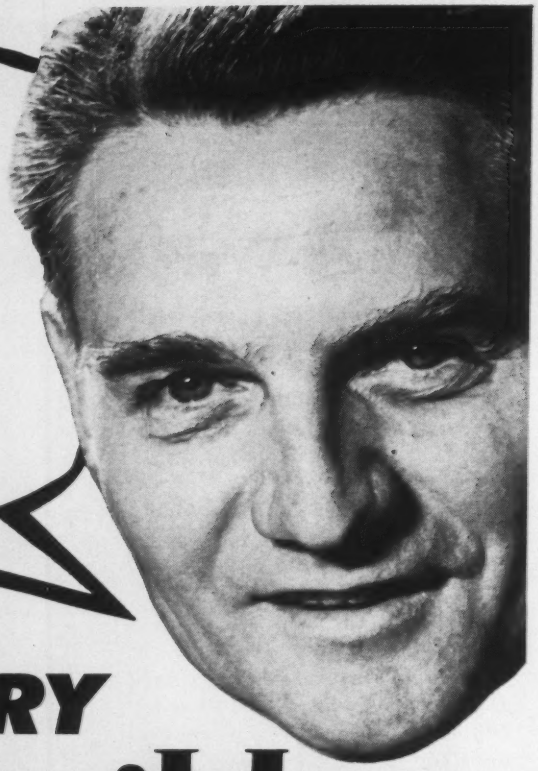
The plan deals with the Federal Trade Commission and four other agencies.

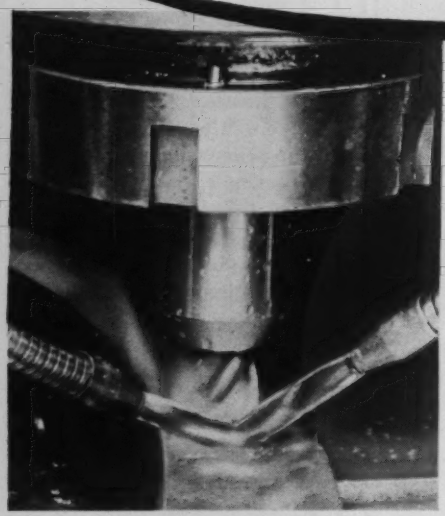
Major criticism by legislators is that the plan would take away the independence of the agencies and turn them into arms of the White House. The agencies now are accountable only to Congress.

## ■ Lead-Zinc Bills Due

Hearings will be held this week in Washington on Federal aid to the lead and zinc industry. These may be the final hearings before Congress moves on various lead-zinc aid bills. The hearings are on a bill to stabilize the price of lead and zinc to small producers.

# HAMIKLEER... The Best Oil-Free, Water-Soluble, Odorless Coolant You Can Buy!





## TRY Hamikleer

(Reg. U.S. Pat. Off.)

## at No Cost to Yourself!

*SEND FOR A **FREE** SAMPLE OF **HAMIKLEER***

Test it on your own metalworking operations. You'll like its extra convenience, better working qualities and its ability to handle tough, critical jobs. You save on inventory, too, because HAMIKLEER can be used on almost all operations on steels or cast iron to eliminate the need for stocking many different coolants. It mixes easily with any water to make a thin bodied, long lasting solution that will not gum or separate.

*Write, wire or call today.*

**1. IT'S SAFE** — non-flammable, non-toxic and it will not cause skin irritations or turn rancid. Operators like it.

**2. LASTS LONGER.** It makes thin, transparent solutions that insure minimum carry-away to save you money.

**3. PREVENTS RUST.** Even in hot, humid weather it protects parts against rust to eliminate costly cleaning.

**4. SAVES ON TOOL AND WHEEL REDRESSING.** HAMIKLEER has outstanding lubricating, heat absorption, convection and anti-weld properties.

**5. IMPROVES PRODUCTION** by providing better finishes and reducing rejects. Work stays cool, clean and visible.

**6. ELIMINATES COSTLY DISPOSAL PROBLEMS.** It will not pollute streams if oil is kept out of the mixture.

HARRY MILLER CORP. HAMICO 4th & BRISTOL STREETS PHILADELPHIA 40, PA

Manufacturers of:
IMMUNOL, STEELGARD, ACTIVOL,
HAMICOTE, HAMIKLEER

**HARRY MILLER CORP.**

*Original Products and Processes Since 1936*

**4th and BRISTOL STS., PHILA. 40, PA.**

**DAvenport 4-4000**

*Service Representatives in Principal Cities*

## Free Trade For Russia With ECSC?

A leading Italian industrialist says the European Coal and Steel Community would hand Russia a major cold war victory if the Reds are given the same chance as the Americans to sell coal in Europe.

**Count Casimiro Sas Kulczycki, purchasing director, Societa Edisonvolta, called such a move "grotesque." He made his remarks at the 16th annual luncheon of the Coal Exporters of the U. S., Inc., in Washington last week.**

Says Mr. Kulczycki: "For her exported raw materials, Russia asks for special machine tools, furnaces and specific preparations. In short, she asks for machinery which tomorrow will enable her to produce automobiles, sewing machines and electric appliances. This will then cause our industries to reduce production, to dismiss workmen and create unemployed men who are, and always will be, potential Communists.

"Once again Russia will have won a major victory in the cold war."

## British Steelmakers Seek Higher Prices

Iron and steel prices in Britain may be rising soon. The executive committee of the British Iron and Steel Federation decided to press for increased steel prices after studying the earnings position of the industry recently.

Since September, 1960, when coal prices were raised, the steel industry's costs have climbed $112 million. Since maximum steel prices are fixed by the government-appointed Iron and Steel Board, the industry has been unable to boost price levels.

British steel leaders say industry earnings have been under an increasing strain in recent months.

## Exports Still Climb As Imports Drop

U. S. merchandise exports continued to rise during the first quarter. And imports kept dropping. This is reflected in a rise of the export-import surplus to a seasonally-adjusted $6.9 billion during that period. This is almost double the surplus for the first quarter of 1960.

**According to the Dept. of Commerce, exports have now climbed to an adjusted annual rate of $20.4 billion—the highest level since the first quarter of 1957. Meanwhile, imports are down to an annual rate of $13.5 billion. This is the lowest level since mid-1958.**

But general exports in April dropped a little. Commerce figures show a 2 pct decline from March (see chart). A similar drop is reflected in April's import figures.

Among the items responsible for the export decline in April are vehicles and machinery, and metals and metal products.

## Indian Aluminum

Consumption of aluminum in India last year rose to 45,000 metric tons from a total of 42,000 metric tons in 1959. Meanwhile, Indian production of primary aluminum in 1960 just about reached capacity levels with a total of 18,254 metric tons. Production in 1959 was 17,393 metric tons. Plans are now underway in India to raise production capacity to an annual rate of more than 83,000 tons.

## Air Cargo Rates To Be Extended

Existing air cargo rates of international airlines, due to expire June 30, have been extended until August 31. This allows time for the airlines to file proper papers with governments involved in a reduction of air cargo rates (IA—May 25, p. 13).

New rates, which would lower the cost of general shipping as much as 65 pct in some instances, will become effective, if approved, on September 1. Expiration date would be March 31, 1963.

Airlines are lowering the rates with hopes that it will open new markets and magnify the flow of bulk cargo across the Atlantic.

## Britain Into ECM: The Push Is On

More than 100 leading British politicians, economists, business men, industrialists and trade unionists have launched a drive to get Great Britain into the European Common Market.

Chairman of the "committee" is Lord Gladwyn, former British ambassador to France. Says Lord Gladwyn: "No one can doubt the force and momentum of the European Economic Community. Its policy is proving more liberal, both economically and politically, than originally seemed likely. This now makes it easier for Britain to join."

# Can the nation's largest buyer of steel tubing solve a buying problem for you?

If you think of Ryerson as a *supplier* of tubing you're only partly right. Because Ryerson is also a *buyer* of tubing—the nation's largest buyer—and this fact holds important advantages for you.

**If your usual requirement can be met from stock,** then Ryerson offers you these problem-solving advantages:

1. As the nation's largest buyer of tubing we, of course, have the nation's largest stocks, giving you the widest selection of types and sizes for immediate shipment.
2. In our biggest-buyer relationship with the mills, we have ready access to the knowledge and skill of all the leading producers. So this help is readily available to you through Ryerson, coupled with the practical application experience of our own tubing specialists.

**If you are generally a direct mill buyer** here's how you gain:

1. At no extra cost you can place mill orders through Ryerson.
2. You deal conveniently with local Ryerson men who take full responsibility for meeting your requirements.
3. As the largest buyer we have a knowledge of sources and position with them that few other buyers can command. You eliminate source searching, paper work, expediting, etc., when you concentrate purchases on one order to Ryerson.

So whatever the size of your requirement, whatever the specification, you can count on Ryerson for fast, dependable delivery. And tight Ryerson controls assure consistent high quality of all shipments. When you need tubing call our nearest plant.

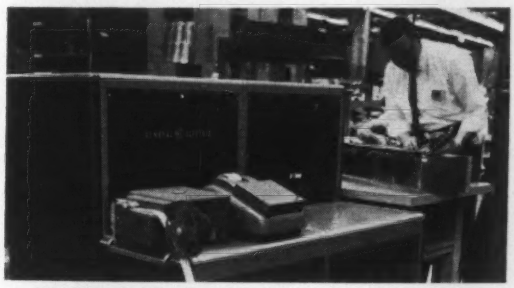
**RYERSON** METALOGICS

JOSEPH T. RYERSON & SON, INC., MEMBER OF THE INLAND STEEL FAMILY

STEEL · ALUMINUM · PLASTICS · METALWORKING MACHINERY

## Automate Quality Control

One of the highlights of last week's Quality Control Convention centered on the introduction of a new line of automatic test systems. Developed by General Electric Co., these control systems can classify and summarize data on in-process workruns. Thus, they pinpoint trends toward failures and correct deficiencies before scrap is generated. Ten models are in the works.



**CIRCUIT TEST:** Checks 32,000 points a minute.

## Joins Plastic Films

Bonding of plastic films becomes a reality with a new ultrasonic sealer. Just placed in production by Ultra Sonic Seal, Inc., after three years in the planning stage, the unit fuses materials heretofore difficult or impossible to weld by standard means. It can join Mylar, polyethylene, polypropylene, nylon and vinyl materials. Scrapping or cleansing isn't needed prior to bonding. The newcomer cleans as it seals through grease, paint, powders, printing ink and oils.

## Furnace Uses Remote Gun

The first electron-beam furnace to use a remote gun for commercial-scale melting has been installed at the Metals Div., National Research Corp. It's melting tantalum and tantalum alloys. When the charge consists of raw powder, sponge, pellets or loose scrap, the remote gun prevents costly interruptions due to pressure bursts. The new furnace also drip melts pressed bars.

## Aluminum Electrodeposits

Intermediate zinc coatings are the key to electrodeposition of aluminum on various base metals. Tests with 99.8 pct aluminum prove that zinc insures good adhesion on magnesium, copper and steel. Final coatings can be anodized by using existing methods. Here are a few points to watch. Under static conditions, electrolytic aluminum can be deposited on copper. For electrodeposition on magnesium, you've got to keep all surfaces clean until the substrate is plated.

## Under-Water Plastics

**Preparations to explore the depths of the sea are taking into account the high strengths needed in hull structures. As pointed out at last week's Annual Plastics Conference, designers are looking into filament-wound glass structures as materials for external hull construction. It's felt that these materials can withstand the deep-sea pressures and still be light enough to carry practical crew-and-equipment payloads.**

## High-Strength Adhesive

Providing 5000-psi bonds, a new epoxy adhesive has built-in toughness and good ductility. It resists chemical attacks and retains its strength after 30-day water-immersion tests. Recommended uses include: Aluminum, steel, copper, ceramics, glass and combinations of these materials. Curing time is moderate, one hour at 300°F. At 225°F, aluminum bonds withstand 3425 psi.

**Tensile Shear Strength, psi**

| | −65°F | 77°F |
|---|---|---|
| Aluminum to Aluminum | 4800 | 5700* |
| Steel to Steel | — | 6500 |
| Copper to Copper | — | 2700 |

*After 30 days in water = 5350 psi

## New Industrial Gages?

Russia's Institute of Nuclear Physics, Uzbek Academy of Sciences, has developed two industrial-isotope gages. One uses $Se^{75}$, a selenium isotope, to pinpoint the lead content in ores, flotation fluids and concentrates. The other uses barium isotope $Ba^{133}$ to plot tungsten contents.

# THREE BILLION DOLLAR VOTE OF CONFIDENCE

## in the future of OHIO

To keep pace with Ohio's dynamic growth, the state's eight investor-owned electric power companies will spend three billion dollars in the coming decade to double capacity. As much new generating capacity will be provided in the next ten years as was built in the past seventy-five.

If you are seeking a plant site, these facts are important for two reasons. First, this is solid indication of the confidence electric utilities have in Ohio's future growth. Second, you can be sure there will be plentiful, dependable electric power for your industry. Today, Ohio's generating capacity is 10.6 million kilowatts, and this state is the number one user of electric power in the nation.

Additional information detailing vital plant site factors is yours for the asking. Send the coupon below on your letterhead for two new booklets of solid facts: Statistical Abstract of Ohio: 1960 and Ohio, The Growth State.

---

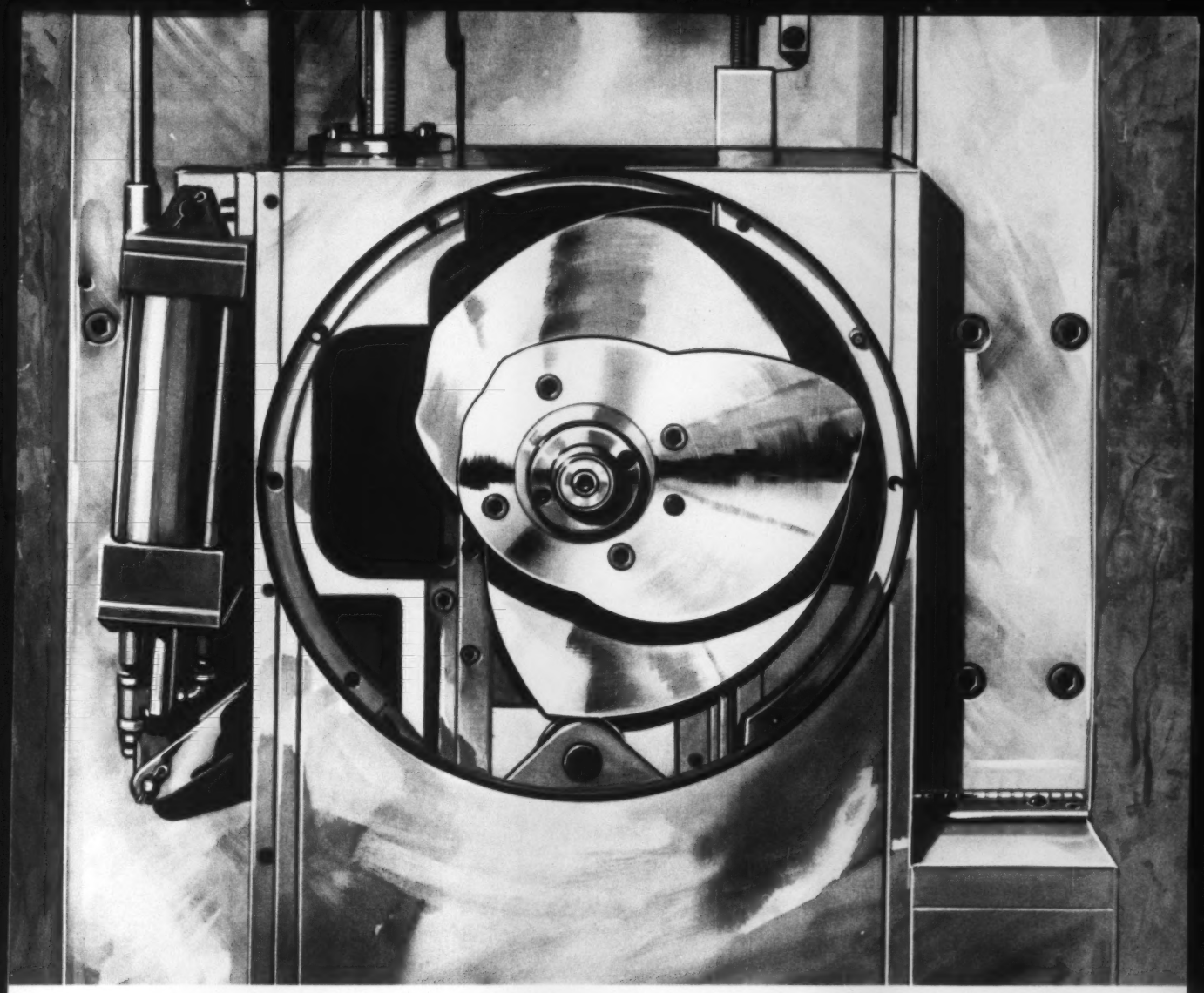
*Koder M. Collison, Director*
**State of Ohio, Department of Industrial and Economic Development**
700 Bryden Road Columbus 15, Ohio

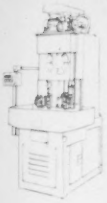
*Please Send:*
☐ Statistical Abstract of Ohio: 1960
☐ Ohio, The Growth State brochure

NAME _____ TITLE _____

BUSINESS ADDRESS _____

CITY _____ ZONE _____ STATE _____





# Exclusive New Britain design
## *for greater boring accuracy*

This is the vertical slide of one of the new series New Britain Vertical Contour Turning and Boring Machines with the front plate removed exposing the cams. These cams are mounted on a common shaft which rides with the vertical slide controlling its motion as well as the motion of the cross slide. Containing all slide actuating forces in the vertical slide is an exclusive New Britain feature which represents a major development in boring machine design.

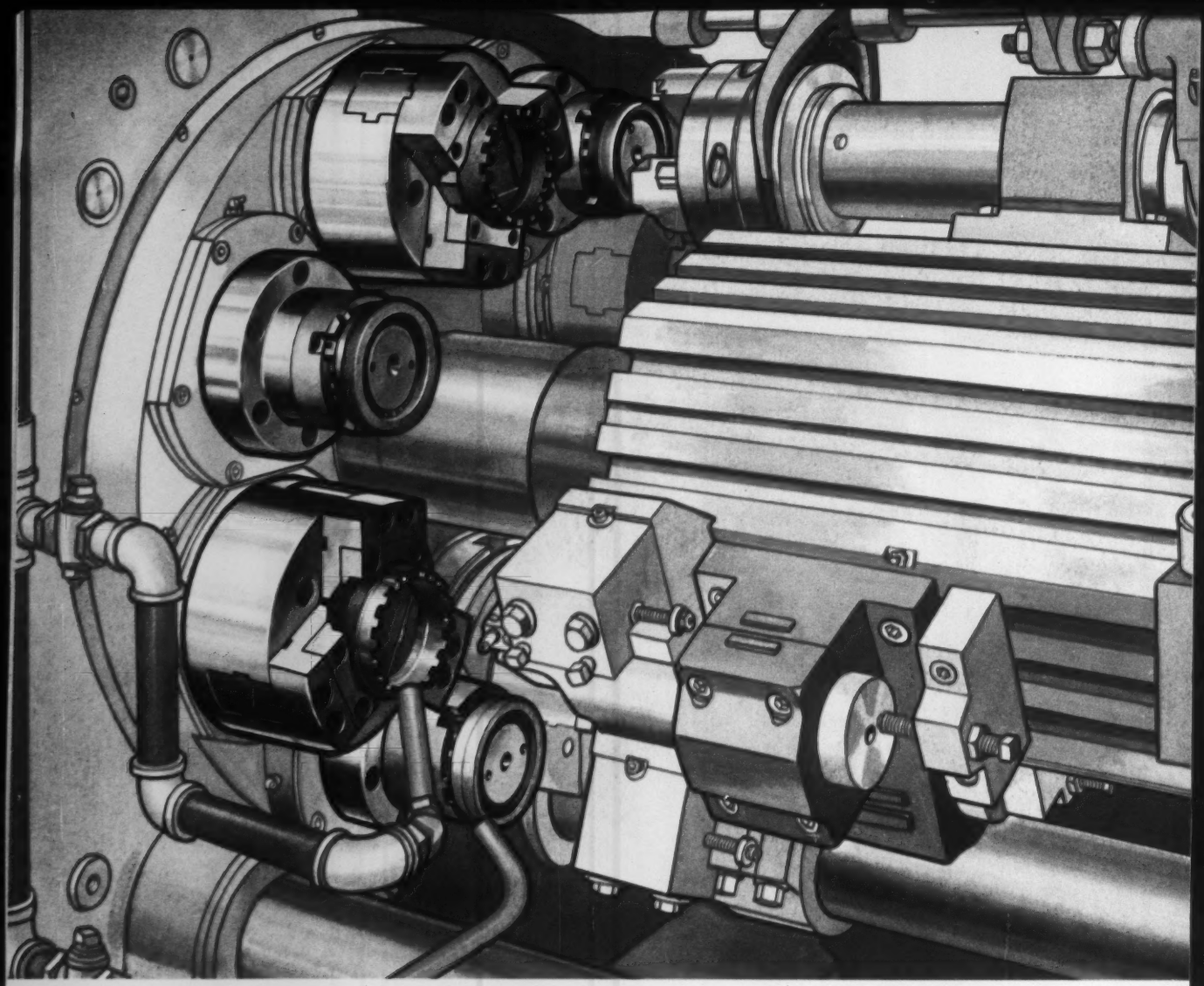
No outside forces are imposed on the slide ways. Extreme accuracy and rigidity are achieved permitting heavy cuts. Finish cuts of less than .0003 tolerance can be made on the same set-up.

The elimination of long actuating linkages has allowed for the design of a compact, clean sided, simplified machine. Cams are quickly accessible and easy to change.

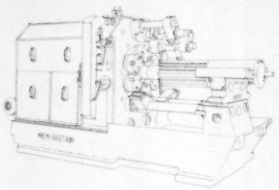
The major improvement which the cam-in-head principle makes on the already widely accepted superiority of cam control results in high repetitive accuracy regardless of the complexity of the piece. Building-block applications, using more than one machine side by side, allow all kinds of possibilities for increased production efficiency.

**THE NEW BRITAIN MACHINE COMPANY**

**New Britain-Gridley Machine Division ◆ New Britain, Connecticut**



# Double indexing... differential chucking pressures *with New Britains*



Here are two features that go a long way toward indicating how much and what kind of work you can do on New Britain's Chuckers. The double indexing feature is a really workable approach to the production of two identical pieces per cycle or both sides of a piece. This application can frequently eliminate the need for second-operation machines. Chucking pressures can be adjusted so that as the machine progresses through the cycle, and more and more metal is removed, the piece will not be distorted.

These are only two of a dozen different New Britain Chucking Machine features. These rugged, powerful machines are your best bet for high production turning, forming, facing, threading, tapping and related operations. New Britain's complete line of chuckers includes four-, six- and eight-spindle models, with work swing up to 17 inches. Wide open design in all models allows for the quickest possible disposition of chips.

Make a point of calling in your New Britain representative soon. Let him show you the dollars and cents reasons for including New Britains in your replacement or expansion plans.

**THE NEW BRITAIN MACHINE COMPANY**

**New Britain-Gridley Machine Division ◆ New Britain, Connecticut**

## The Two K's

**Sir**—I find myself in complete agreement with the thought expressed in the last two paragraphs of your May 25 editorial ("Kennedy vs Khrushchev: This Is a Poor Time for It"). The paragraphs say "Until Mr. Kennedy knows what he wants, and until the people know what he wants, a meeting with Mr. Khrushchev is the worst form of weakness."

It is basic that when a salesman goes on the road, he must know what he is trying to sell.

**But who is going to set sales objectives, the PhD's or the businessmen?**

I think it is the responsibility of men in industry to help in any way they can to develop the basic selling idea for our economy. They must define what it is that we could make people want, believe in, and come to us exclusively to get.

I believe this basic selling idea is to be found in the concept of our competitive economy.—Frederick A. Richardson, New York, N. Y.

**Sir**—"Kennedy vs Khrushchev: This Is a Poor Time for It" (IA—May 25, '61) is a magnificent editorial. You are 100 pct right. But we must carefully analyze the situation—John Obrebski, Sidney, O.

## Excellent Balance

**Sir**—Thank you so much for your thought-provoking editorials in The IRON AGE.

It is my opinion that you have an excellent balance of business, labor, and social attitudes and express them well at all times. There are times when I do not agree with you entirely, but this does not detract from my belief that you are good for the metal industry.

Your editorial in the May 4 issue ("Freedom Is Dying: The Reds Are Killing It") is most timely and vital.

Thank you for helping us do a better job, and forcibly calling attention to our political and social responsibilities.—C. A. Anderson, Haskins Steel Co., Inc., Spokane, Washington.

**Sir**—I would like to have as many copies of the "Freedom Is Dying . . ." editorial as you can spare. After hearing Herbert Philbrick recently, we do not have a moment to waste. We must all be about our country's business.—Dr. M. Holtman, P. R. Mallory & Co., Inc., Indianapolis.

## For Research

**Sir**—We receive The IRON AGE at Wright Junior College and find it a most useful magazine. Presently, I am going through all issues as far back as 1957 and 1958 in a search for a complete story on the technical improvements in the steel industry in recent years.

This information is being written up in a rather detailed economic report. Would it be possible for me to receive two copies of the semi-annual index of your magazine to aid in this research?—Alphons A. Bogen, Wright Junior College, Chicago.

**▪ Two copies of the semi-annual index for the years 1957 through 1960 are being mailed.—Ed.**

## Wage Rates

**Sir**—It is my recollection that a few months ago you published an article indicating the relative manufacturing wage rates in various European and foreign countries compared to the American rates.

If available, I would appreciate receiving additional copies which I plan to use in connection with correspondence to legislators and business executives.—C. V. Schaefer, Jr., Aeroil Products Co., Inc., South Hackensack, N. J.

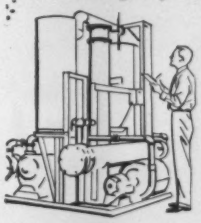
**▪ The article is probably "European Wages Still Draw U. S. Companies" which appeared on the international news page in The IRON AGE issue of Dec. 22, 1960. Copies of this article will be sent.—Ed.**

Carl G. Paulson,
Director of Hayes Research and Development Group, Reports...

**NEW NITROGEN POTENTIALS**

**Assume you face the need** for high purity nitrogen at a low per-unit cost figure. You want to use it as a heat treating atmosphere . . . or as a "blanket" for hydrocarbons or food products . . . or for any one of a number of industrial applications. How can you bring this safe, inert gas out of the lab and into general use without inflating your costs?

**Our R & D group reasoned** that a low cost generator was the logical solution and followed up and developed a completely new piece of equipment—the C. I. Hayes "Nitro-Gen." This unique combination of stationary retort and cyclical programmed dryer has cleared the way for production of 99.99% pure inert gas at approximately 20c per thousand cubic feet.



**The immediate benefits** of low cost nitrogen as a protective heat treating atmosphere were revealed in initial metallurgical applications. For example, test bars of Type 8670. Carbon Steel were subjected to routine hardening under (1) nitrogen, (2) dissociated ammonia, and (3) endothermic gas atmospheres—each test followed by routine oil quench and tempering. Hardness results from these tests proved identical . . . but a substantial boost in toughness showed up in the bars treated under nitrogen. The nitrogen atmosphere produced 100% greater toughness, according to a transverse break test.

*Safety alone* makes nitrogen worthy of careful consideration. If this non-combustible gas can be produced efficiently and economically (and we're doing it!), Hayes R&D Engineers believe its potentials are virtually limitless.

*Blanketing operations* are No. 1 prospects for the Hayes Nitro-Gen . . . in *food, paint, petroleum, chemical,* and *petrochemical* industries . . . where low cost per cubic foot of produced gas means fast pay-back on the job.

We'll gladly demonstrate the Nitro-Gen in our lab or send technical literature if you desire. Request Bulletin 5901-NI.

Linde MOLECULAR SIEVES ®UCC

Designed in conjunction with Linde Company . . . to utilize Linde Molecular Sieves

Established 1905

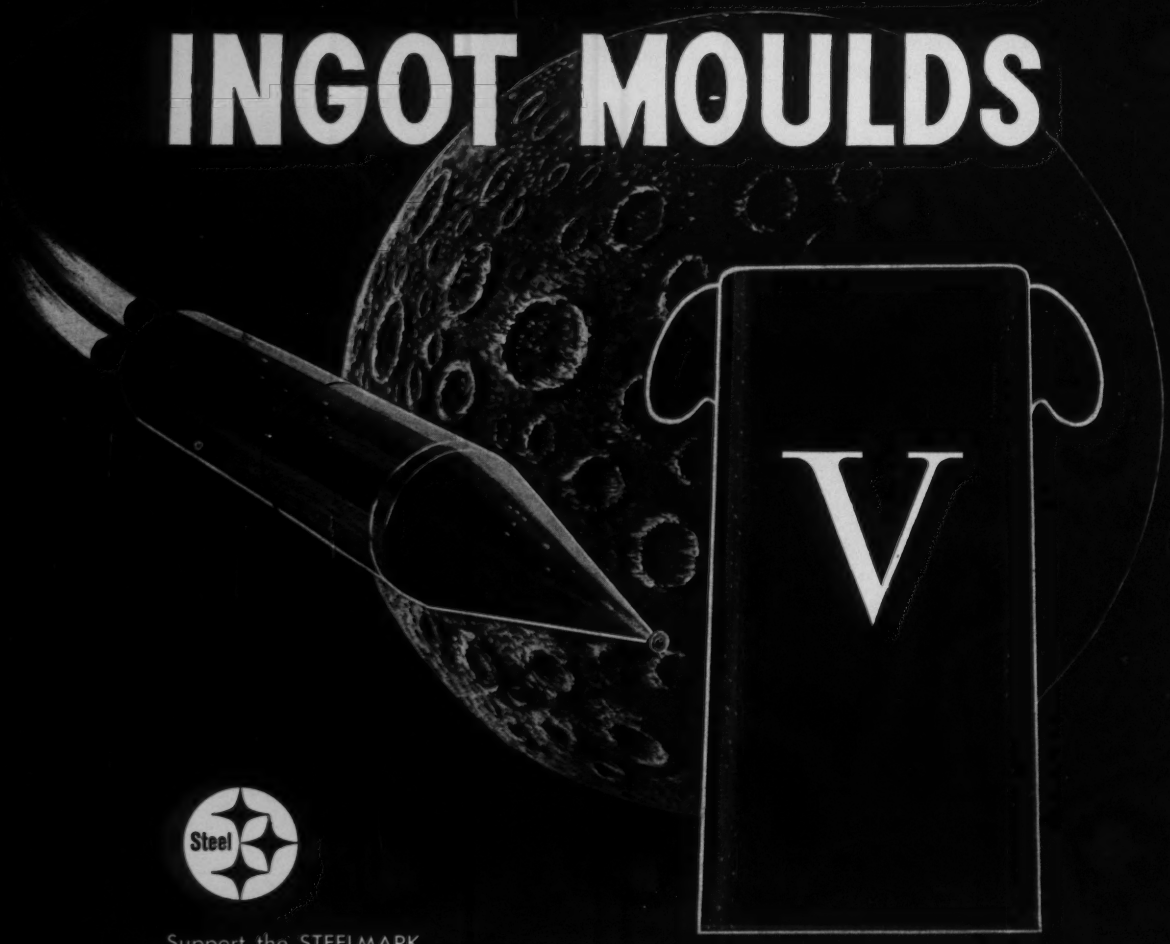
**C. I. HAYES, INC.**

821 WELLINGTON AVE. • CRANSTON 10, R. I.

Whatever the job, **it pays to see HAYES** for metallurgical guidance, laboratory facilities, furnaces, atmosphere generators, gas and fluid dryers.

For over 75 years steel has been poured into Valley Moulds, and now the new metals... used in space . . . . will also be poured into

# VALLEY INGOT MOULDS




Steel

Support the STEELMARK

**VALLEY MOULD AND IRON CORPORATION**

GENERAL OFFICES: Hubbard, Ohio
WESTERN OFFICE: Chicago, Illinois
NORTHERN OFFICE: Cleveland, Ohio

## Washington Pace

The nation's capital is a busy place. But for our man in Washington, Ralph Crosby, the last few weeks have been busier than usual.

The results of his efforts show up in this issue. First, there's his cover story beginning on p. 73: "Who Gets Patents When U. S. Pays for R & D."

**From the Senate . . .**—This story took Ralph to the Senate Office Building for an interview with Sen. John McClellan (D., Ark.), chairman of the Subcommittee on Patents, Trade Marks, and Patent Rights. Ralph also sat in on the hearings.

From the interview, the hearings, and other sources, he put together the definitive story you'll read this week.

**. . . To the House**—From the Senate, editor Crosby moved to the House for another story, also in this issue—hearings on reform of the tax laws on foreign income of U. S. companies.

And finally, Ralph used material gathered from Congress, the Administration, and government bureaus to turn out his weekly column.

## Photos From Germany

Good photographic support is an important part of any story.

For his reports from West Germany, Managing Editor E. C. Beaudet had only the best.

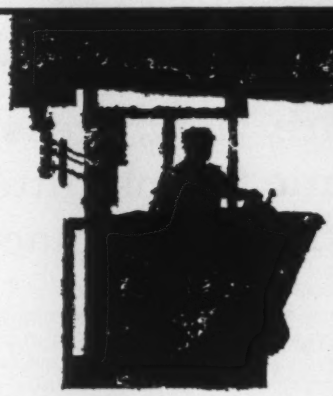
As luck would have it, cover photographer Larry Williams was on assignment for Volkswagen when Gene visited VW's plants.

After the visit, Gene took off to probe West German industry; Larry had an assignment for U. S. News and World Report. They agreed to meet later—if possible. But they lost track of one another.

**Waiting at the Plane**—However, Larry anticipated his moves. When Gene stepped off the plane at Dusseldorf, the photographer was on hand with officials from Phoenix-Rheinrohr A.G. The result is the photos on pp. 80-81, taken at Phoenix's Mullheim plant.

The largest press brake on the Continent (cover for the first of the reports), photos of American exhibits at the Hanover Fair, and others in the series are also Larry's work.

**PHOTO SUPPORT:** Larry Williams' photo of E. C. Beaudet (left) and Phoenix-Rheinrohr officials was taken at Mullheim plant.

**MODERNIZE YOUR CRANE!**

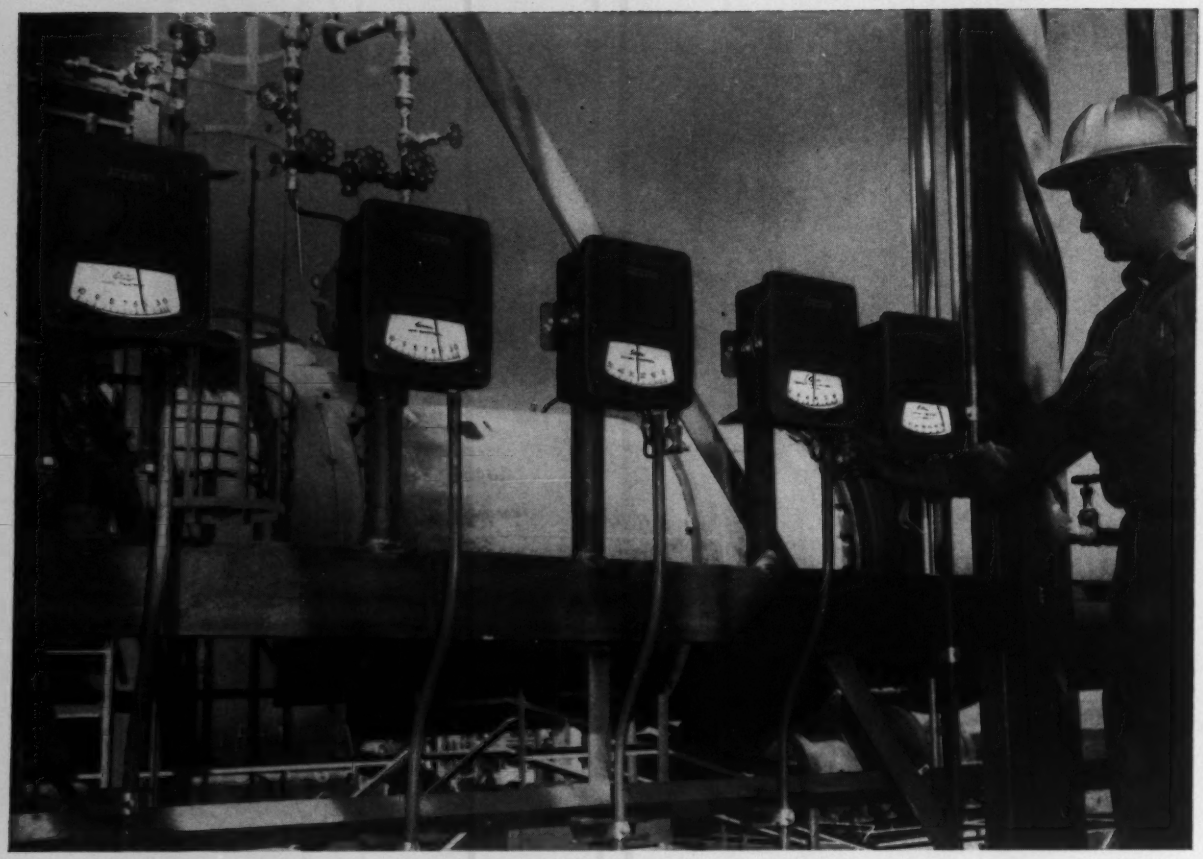
Watch that overhead crane perform. Smooth, anti-friction operation. Plenty of head-room. Modern, efficient controls. Brand new? —No.

That's a Pollock Engineering rebuilt crane. Redesigned and remanufactured to meet the requirements of your plant. Pollock is the nation's foremost expert in re-engineering heavy-duty hoisting equipment. Altering spans. Converting D.C. to A.C. Increasing capacity. Installing new controls. Contact us, outlining your requirements.

**POLLOCK**

ENGINEERING CO., INC.

POTTSTOWN, PENNSYLVANIA



Type 630 indicating electronic Consotrol transmitters may be equipped with any standard Foxboro measuring element. Transmitters continue to measure and indicate even in event of power failure.

# Temperature, flow, pressure, level – Foxboro Electronic Transmitters will measure and transmit them any place wires can go

FOR DISTANCES up to several miles, Foxboro Electronic Consotrol* Transmitters are the fastest, most accurate way you can transmit a measured variable.

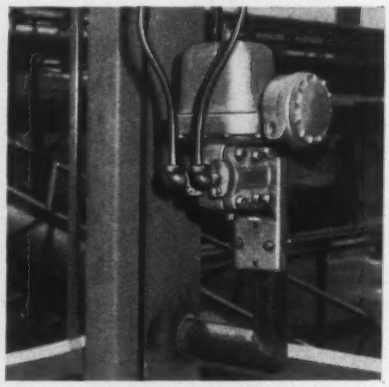
There's no transmission lag. Electric signals are transmitted instantly over two small, unshielded wires to centrally-located recorders and controllers.

Both the Foxboro Indicating and Force-Balance Electronic Transmitters have no vacuum tubes to burn out. Instead, dependable, solid-state components are used throughout to insure years of trouble-free operation.

Zero and span settings are simple mechanical adjustments. And your present personnel will need no special training or skills to operate them.

Foxboro Electronic Transmitters can be mounted anywhere — in any position. Heavy-gauge, tight-gasketed cases completely protect them from dust, dirt, and weather.

Ask your Foxboro Field Engineer how they can help improve the efficiency of your operation. Or write for Bulletin 21-10 — it tells the whole Electronic Consotrol story. The Foxboro Company, 806 Neponset Ave., Foxboro, Massachusetts.



Type 613 d/p Cell* transmitter combines simplicity and accuracy of force-balance with speed and convenience of electrical transmission. Requires no power supply at the transmitter.

*Reg. U. S. Pat. Off.*

FOXBORO

REG. U.S. PAT. OFF.

## COMING EXHIBITS

**Great Lakes Show**—Material Handling Institute, June 19-21, Detroit.

**Western Plant Maintenance & Engineering Show**—July 18-20, Pan Pacific Auditorium, Los Angeles. (Clapp & Poliak, Inc., 341 Madison Ave., New York, 17.)

**Industrial Building Exposition**—Sept. 25-28, New York Coliseum.

## MEETINGS

**JUNE**

**Industrial Engineering Seminars**—June 13-16, Cornell University, Ithaca, N. Y.

**Drop Forging Assn.**—Annual meeting, June 14-17, The Greenbrier, White Sulphur Springs, W. Va. Assn. headquarters, 1121 Illuminating Bldg., Cleveland.

**Pressed Metal Institute**—Sales conference, June 15 - 16, Bedford Springs Hotel, Bedford Springs, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

**National Assn. of Metal Finishers**—Annual Convention, June 16-19, Boston.

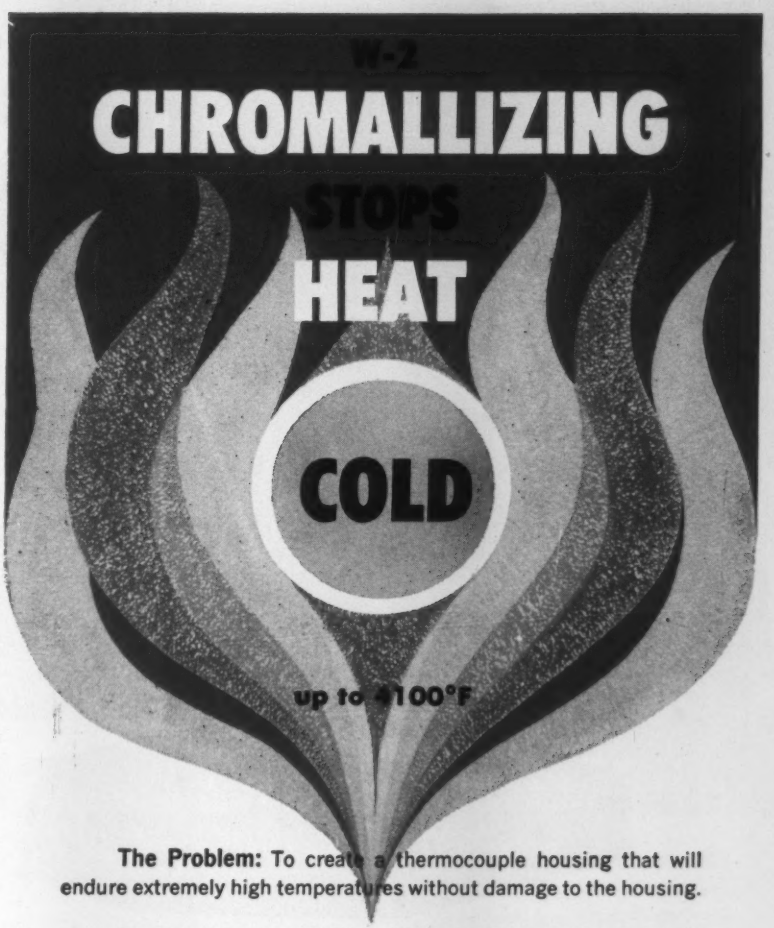
**Material Handling Institute, Inc.**—Meeting, June 18-20, Hilton Hotel, Pittsburgh. Institute headquarters, One Gateway Center, Pittsburgh.

**Alloy Casting Institute** — Annual meeting, June 18-20. Institute headquarters, 1001 Franklin Ave., Garden City, N. Y.

**American Electroplaters' Society**—48th Annual convention, June 18-23, Statler-Hilton Hotel, Boston. Society headquarters, 445 Broad St., Newark, N. J.

**Investment Casting Institute**—Advance technical meeting, June 20-21, Case Institute of Technology. Institute headquarters, University Circle, Cleveland.

**(Continued on P. 24)**


**The Problem:** To create a thermocouple housing that will endure extremely high temperatures without damage to the housing.

**The solution:** A CHROMALLIZED molybdenum thermocouple housing. This housing withstands temperatures up to 4100°F. Other applications are structural parts for re-entry vehicles, high temperature testing grips, and ramjet engine components.

**What is Chromallizing?**
A proven process for diffusing chromium and other elements into the surface provides an alloy case which is integral with the base metal. It can't peel or flake. the chromium and other elements diffuse uniformly into recesses, pores, cracks and even blind holes.

**CHROMALLIZING** processes are also being used to protect superalloys for jet engine parts and to protect ordinary steel against wear, oxidation and corrosion.

WRITE FOR ILLUSTRATED BULLETIN RC

**Chromalloy corporation**

169 WESTERN HIGHWAY, WEST NYACK, N. Y.
ELmwood 8-5900

CHROMIZING CORPORATION, HAWTHORNE, CALIFORNIA
PROPELLEX CHEMICAL DIVISION, EDWARDSVILLE, ILLINOIS
Propellents, cartridge actuated devices, explosives and special chemicals.
ELYRIA FOUNDRY DIVISION, ELYRIA, OHIO. Quality gray iron castings.
SINTERCAST DIVISION, WEST NYACK, N. Y. Machinable carbides & nuclear materials.
SHUNK MANUFACTURING CO., INC., BUCYRUS, OHIO. Replaceable blades for road construction and maintenance equipment.

To Keller Manufacturing Co., Inc., it means a savings of nearly $50 a day in finishing costs on leaf rakes. And, theirs is a comparatively small plant operation.

Before moving into their new plant, this St. Louis manufacturer of Sweep-Easy lawn and garden tools investigated and tried out various finishing equipment. They chose Ransburg No. 2 Process to do the job because they found that only the Ransburg Electrostatic Hand Gun could give them the desirable increase in production—with improved quality—and at lower cost.

**PRODUCTION IS NEARLY DOUBLED**
**QUALITY OF FINISH IS IMPROVED**

With the Ransburg Hand Gun, Keller's daily painting prodution of leaf rakes nearly doubled what they were formerly getting with air hand spray. And, where they used to get only 168 rakes per gallon of paint, they now get 426 per gallon—over 2½ times as many—actually *an increase of over* 150% *in paint mileage.* With the unique "wrap-around" feature, electrostatic is improving the quality, providing a complete, uniform coating over all areas—even on the tine edges.

**NO REASON WHY YOU CAN'T DO IT, TOO!**

See how the Ransburg Electrostatic Hand Gun can save time . . . paint . . . and cut costs in YOUR finishing department. Or, if your production justifies, it'll pay you to investigate Ransburg's automatic electrostatic spray painting equipment. Write for our No. 2 Process brochure which shows numerous examples of modern production painting in both large and small plants.

RANSBURG

**RANSBURG Electro-Coating Corp.**

Box 23122, Indianapolis 23, Indiana

Affiliates in AUSTRALIA • AUSTRIA • BELGIUM • DENMARK • ENGLAND • FRANCE • FINLAND • GERMANY, HOLLAND • ITALY • NORWAY • SPAIN • SWEDEN • BRAZIL • SOUTH AFRICA and NEW ZEALAND

## MEETINGS

**(Continued from P. 23)**

**Electric Overhead Crane Institute** —Meeting, June 21, Detroit Athletic Club, Detroit. Institute headquarters, One Thomas Circle, Washington 5, D. C.

**American Assn. of Cost Engineers** —Annual meeting, June 21-23, Somerset Hotel, Boston.

**National Tool & Die Manufacturers Assn.**—Summer meeting, June 21-25, Schroeder Hotel, Milwaukee. Assn. headquarters, 907 Public Square Bldg., Cleveland.

**American Society for Testing Materials**—Annual meeting, June 25-30, Chalfonte - Haddon Hall, Atlantic City, N. J. Society headquarters, 1916 Race St., Philadelphia.

**American Vacuum Society** — 5th Annual conference, June 26 - 27, Heights Campus, New York University, New York.

### JULY

**Cast Iron Pipe Research Assn.**—Annual meeting, July 26-27, Seaview Country Club, Absecon, N. J. Assn. headquarters, Prudential Plaza, Suite 3400, Chicago.

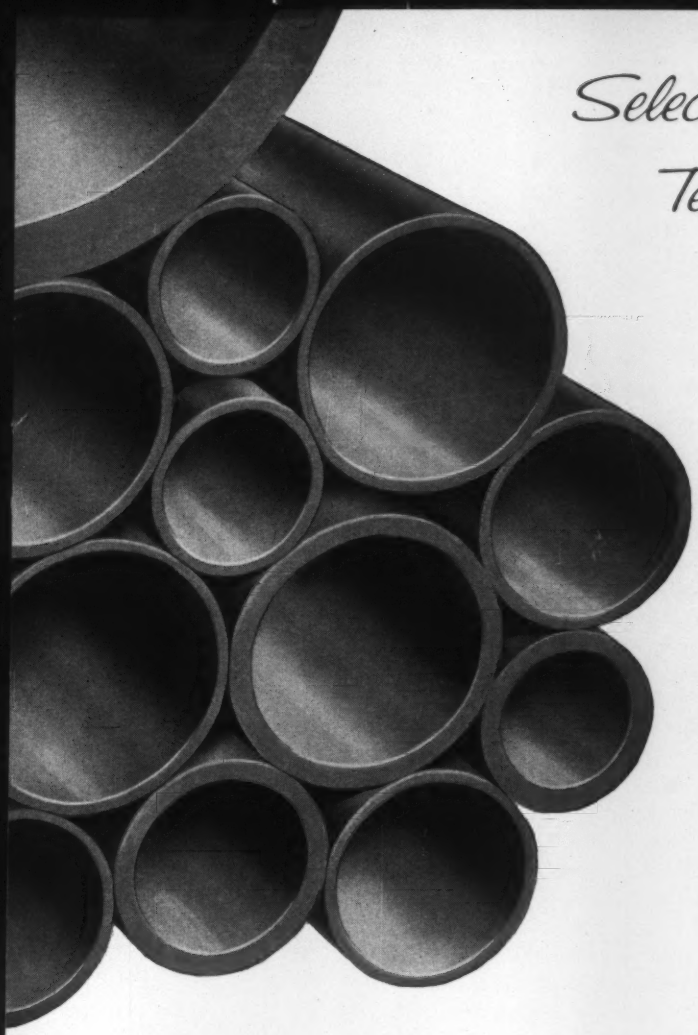
### AUGUST

**Metallurgical Society of AIME**—Semiconductors conference, Aug. 30—Sept. 1, Ambassador Hotel, Los Angeles. Society headquarters, 29 W. 39th St., New York.

### SEPTEMBER

**Non-Ferrous Founders' Society**—Annual meeting, Sept. 17-21, Shawnee Inn, Shawnee-on-the-Delaware, Pa. Society headquarters, University Bldg., 1604 Chicago Ave., Evanston, Ill.

**Assn. of Iron and Steel Engineers** —Annual convention, Sept. 25-28, Penn - Sheraton Hotel, Pittsburgh. Assn. headquarters, 1010 Empire Bldg., Pittsburgh.



*Selection* of finest raw materials

*Testing* every step of the way

*Inspection* to rigid standards

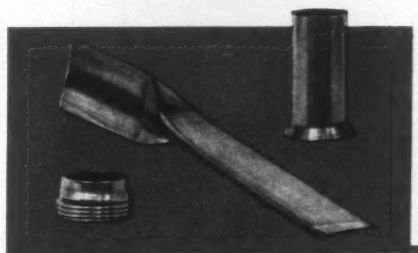
# *Assure 100% dependability for*

# OHIO WELDED PRESSURE TUBING

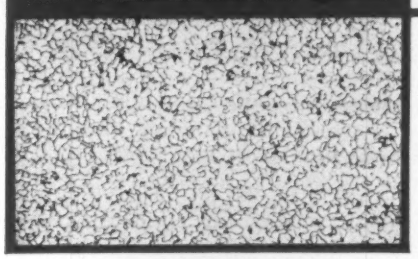
You can be sure — doubly sure — of utmost tubing dependability when you specify Ohio Welded Pressure Tubing — *made by Ohio Seamless.* First, Ohio works to accepted industry standards — ASTM, ASME, and similar Federal and military specifications covering welded pressure tubing. Second, Ohio Welded Pressure Tubing is produced under a *continuous* process of quality control — not just a final test inspection to cull questionable material.

Carefully selected prime raw material is slit, edged, shaped and electric resistance welded on the most versatile and modern equipment in operation. At each and every step of the way Ohio Welded Pressure Tubing is under the scrutiny of Ohio's master tubemakers . . . making control tests at frequent intervals . . . testing random samples from each production order far beyond the limits of the usage involved.

For critical pressure piping applications . . . for condensers, heat exchangers, boilers and superheaters — in the range of sizes from ½ to 7½" OD and wall thicknesses from .028 to .375"— mark your prints "*Ohio Custom Made Welded Pressure Tubing.*" There is no equivalent.



Photographs show flare, flattening and crush tests performed continuously on every order. Non-destructive tests include air, water, magnetic, eddy current and visual inspection to insure 100% dependability.



Photomicrograph of polished and acid-etched surface shows perfect microstructure of normalized Ohio Welded Pressure Tubing. Weld area running down the center is now indistinguishable and tube has become, in every sense, weldless.

OHIO

## OHIO SEAMLESS TUBE

*Division of* Copperweld Steel Company

**SHELBY • OHIO**

*Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging*

*Representatives in principal cities. Check leading directories:*
THOMAS', MacRAE'S, CONOVER-MAST, SWEET'S, FRASER'S.

A-4800A

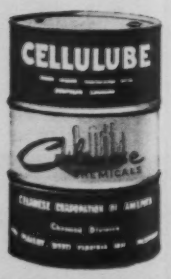
Cellulube 220 was chosen for this hydraulic press when it was installed at North American in 1956. At that time it was used for form-die quenching of hot, fully expanded titanium parts at 1000°F.

...and since 1959, this same press has been used to form brazed stainless steel "honeycomb" panels for the B-70 bomber. The panels are pressure-quenched at 1700°F. Cellulubes are still safely on the job.

# at 1000°F...or 1700°F...Cellulubes

FM Factory Mutual-Approved
(Cellulubes 150 and 220)

Bureau of Mines—Approved #30-2




**Celanese Chemical Company, Dept. 578-F, 180 Madison Avenue, New York 16, N. Y.**

Data on Cellulubes, please!

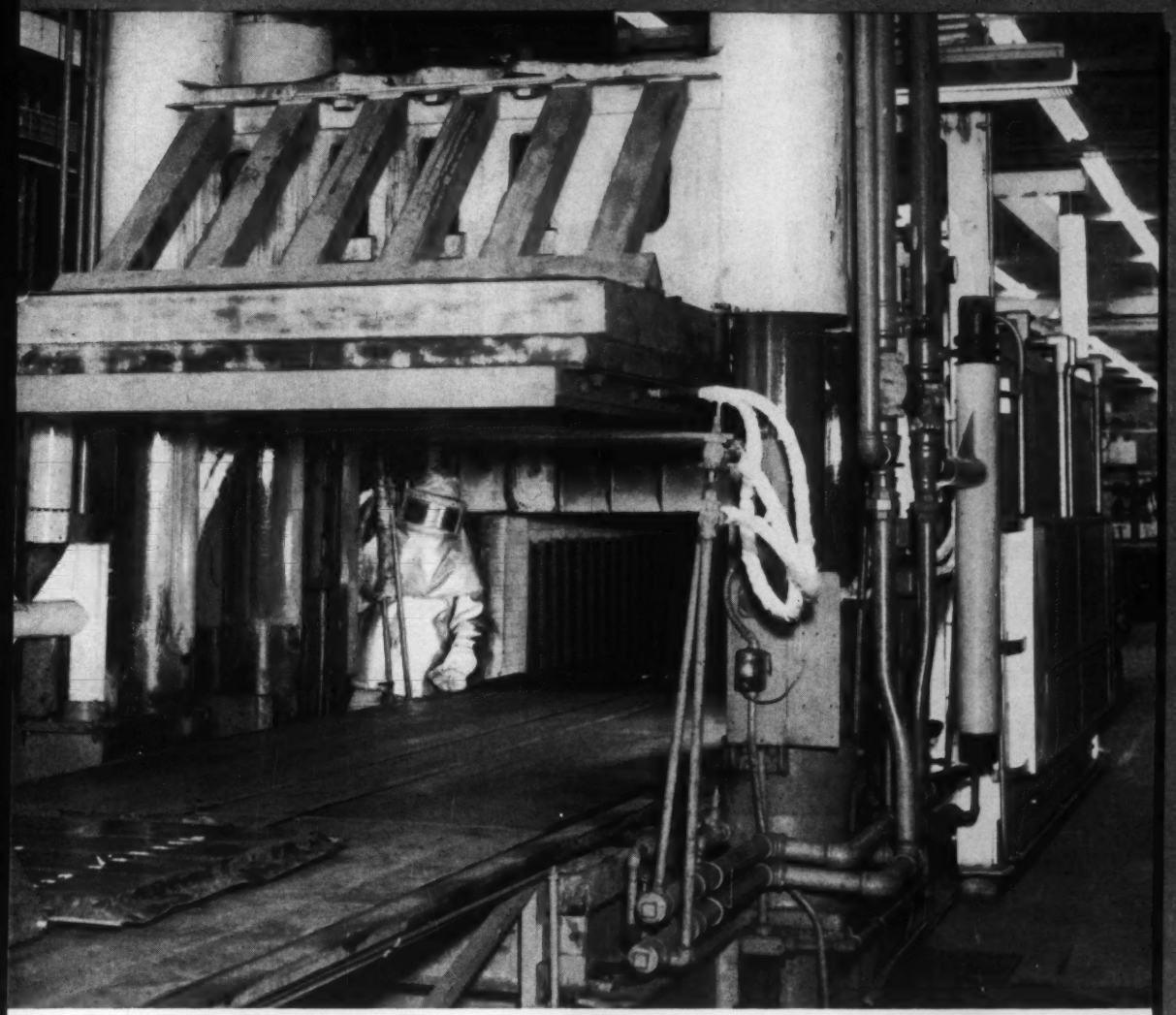
Name_____

Company_____

Address_____

City_____ Zone_____ State_____

Application I have in mind_____



# guard safety at North American

In high-temperature press-forming operations like these, hydraulic line breaks could be a serious fire hazard. North American Aviation assures maximum protection for personnel and equipment by using Celanese Cellulubes—the *safe* hydraulic fluids. It's the best way to take the worry out of high-temperature production.

Perhaps you should be using Cellulubes, too! In addition to their safety advantages, Cellulubes provide overall protection against wear comparable to that of premium petroleum oils. There are no foaming problems, no additives to deposit in the system. Vapor pressure is extremely low; vapor losses negligible. And Cellulubes come in your choice of six viscosity ranges.

Mail the coupon for details. Celanese Chemical Company, 180 Madison Avenue, New York 16, New York.

Celanese® Cellulube®

**Cellulubes... Celanese CHEMICALS fire-resistant functional fluids**

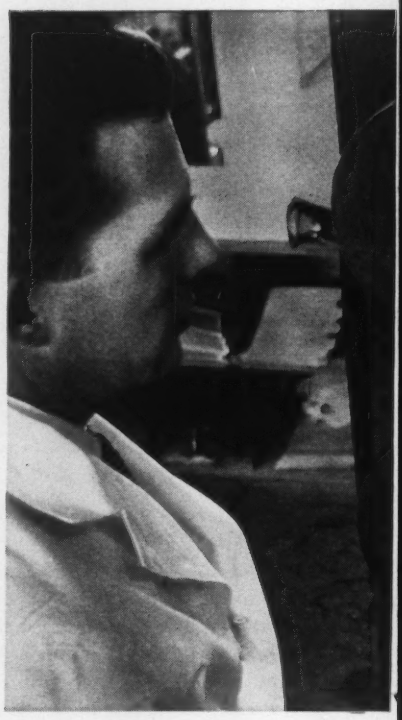
In Canada: Canadian Chemical Company Limited, 2035 Guy St., Montreal, Toronto, Vancouver • Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Ave., New York 16

CELANESE CELLULUBES

GOODYEAR

# EXCLUSIVE! GOODYEAR GREEN SEAL V-BELTS

**to give you sets that are precision-matched in length to outperform...and outlast...all others**



*At no extra cost,* GREEN SEAL *V-Belts also give you:*

**Dimensional stability** throughout the life of the belts via highly shrink- and stretch-resistant 3-T Process Cord or airplane-type steel cable.

**Protection against dampness** through special mildew-inhibited rubber compounds.

**The most complete line** of V-Belts in the industry—easily and quickly available through our nationwide network of distributors.

**Still another "plus":** The G.T.M.—Goodyear Technical Man—is available to help you select the right belts for any drive.

**For your best buy in multiple drive belts**—including new money- and space-saving HY-T Wedge V-Belts—look to Goodyear. Also, get the full story on P.D. (positive drive) Belts and Variable Speed Belts from your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

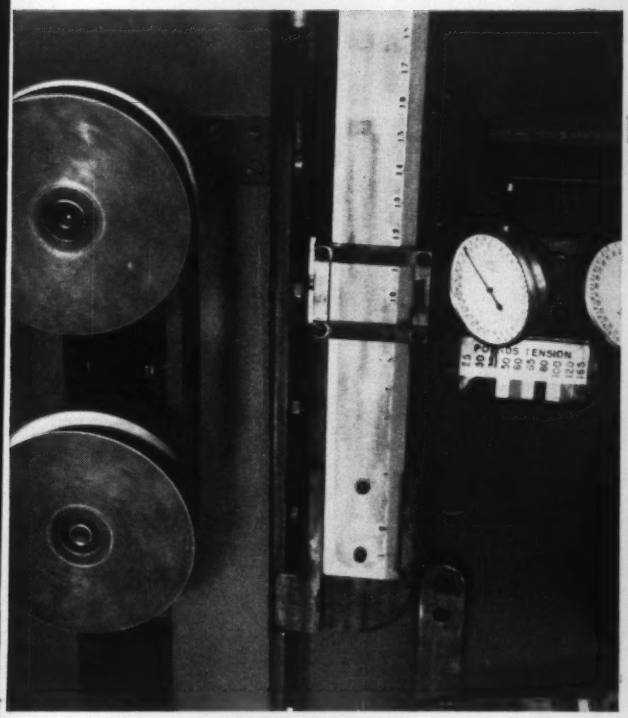
**Lots of good things come from**

**GOODYEAR**

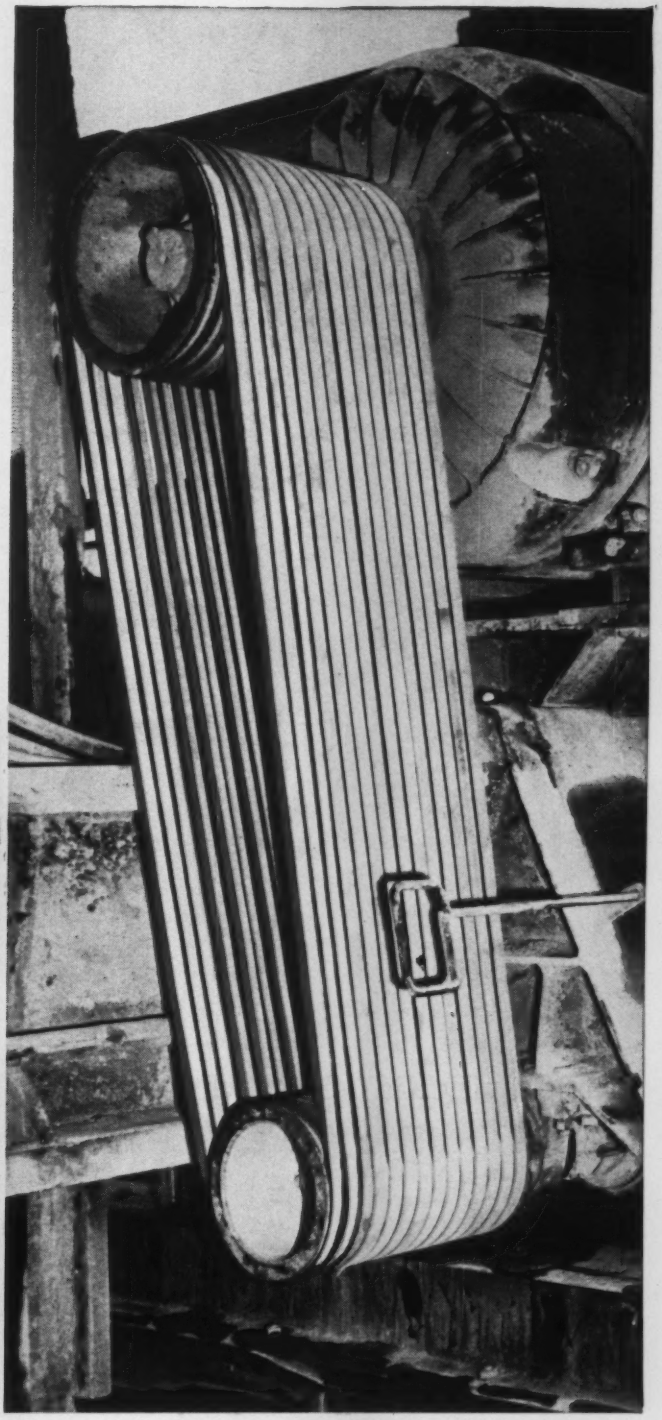
INDUSTRIAL PRODUCTS

Compass, Green Seal, Hy-T, P.D.—T.M.'s
The Goodyear Tire & Rubber Company, Akron, Ohio

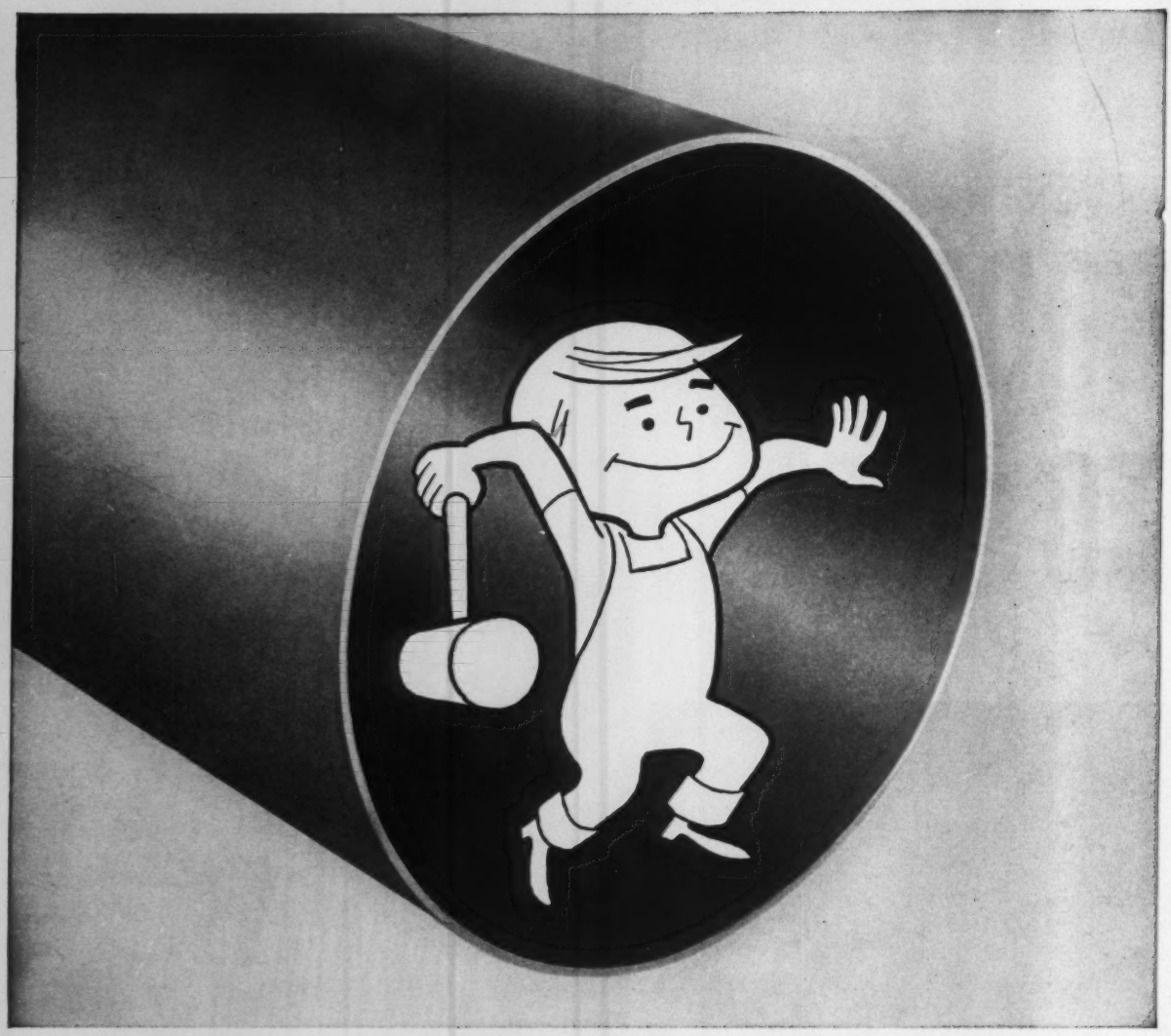
# CODES TO 1/32"...



**Length-coding GREEN SEAL V-Belts to 1/32"—not just 1/10" like most belts**—takes this ultra-precision machine. *Only* Goodyear has this type of equipment, which is set by means of fine-tolerance steel templates to insure accuracy.



**Harnessing this big, 22-saw stonecutter for 3 full years** required COMPASS-V-Steel Belts by Goodyear. Over this period, the Goodyear belts helped carve up 20 tons of rock a day—over 15,000 tons in all. Normal V-belt life in this type of rugged service is a scant 6 months.



"The Gravity Kid" shows why

# CONTOUR-WELDED TUBING OFFERS GREATER FATIGUE STRENGTH, LONGER SERVICE LIFE

**Tubing fatigue strength depends largely *on how the tube is welded,* and the results obtained. Tubing that's smooth inside – free of flaws and bulging weld beads – offers much greater fatigue strength and longer service life.**

Contour-welded* ***tubing is smoother inside*** **than** conventionally-welded **tubing. It's smoother because *it's welded at the bottom.* Gravity pulls the metal down so that the weld corresponds to the tube's inside contour. There's no bulge on the inside surface. Even on the outside, the seam closely conforms to the tubing shape.**

***Contour-welding provides greater strength*** **than conventional welding, because in conventional welding, gravity pulls the molten metal down into the tube. This can form a bead that is difficult to remove by cold working. And cold working can lead to deep, sharp undercuts that seriously weaken the tube.**

***Contour-welded tubing is smoother than seamless, too.*** **That's because it's formed from uniformly rolled strip steel; whereas, seamless is produced by extruding or piercing. This strip is 100% inspected. So, there are no undetected tears or fissures inside.**

***See for yourself why Contour-welded tubing offers greater fatigue strength, longer service life.*** **Write today for our free 48-page manual which describes tubing sizes from 1/8" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy, and Hastelloy**.**

*U.S. Patent 2,716,692

**Trademark Haynes Stellite Co.

## TRENTWELD® Stainless and High Alloy Tubing

Trent Tube Company, a Subsidiary of Crucible Steel Company of America, General Offices and Mills: East Troy, Wisc.; Fullerton, Calif.

# 10
## Research-Cottrell precipitators for basic oxygen steelmaking

*At present Research-Cottrell has designed a total of ten precipitators for basic oxygen steelmaking with a total capacity of approximately 2,000,000 cubic feet per minute.*

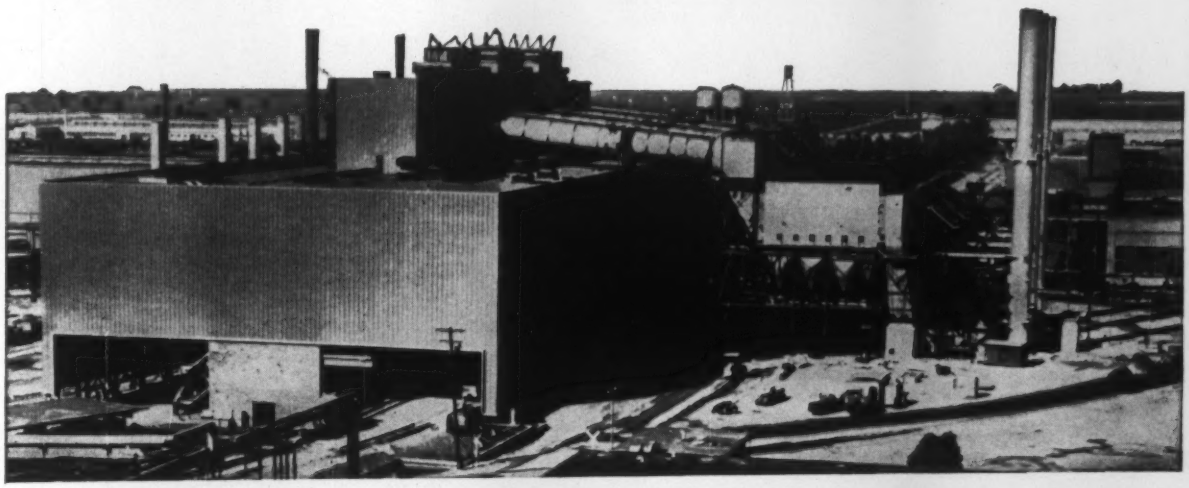
### The World's Largest Electrical Precipitators For Basic Oxygen Steelmaking

The Cottrell precipitators at the right of the photo remove dust and fume from waste gases at the Kaiser Fontana Plant with 99.8% efficiency. This huge new basic oxygen steel plant was designed and constructed by Kaiser Engineers.

The three Cottrells were designed and built by Research-Cottrell to clean 607,500 cubic feet of gas per minute from the oxygen furnaces. They are installed between the furnace exhaust ducts and the fans serving the three stacks seen at right below.

The high gas cleaning efficiency of this installation is obtained by means of tested and proven Cottrell design features including electrical sectionalization, Opzel collecting plates, and continuous, automatic operation of high tension rappers and M.I. plate rappers.

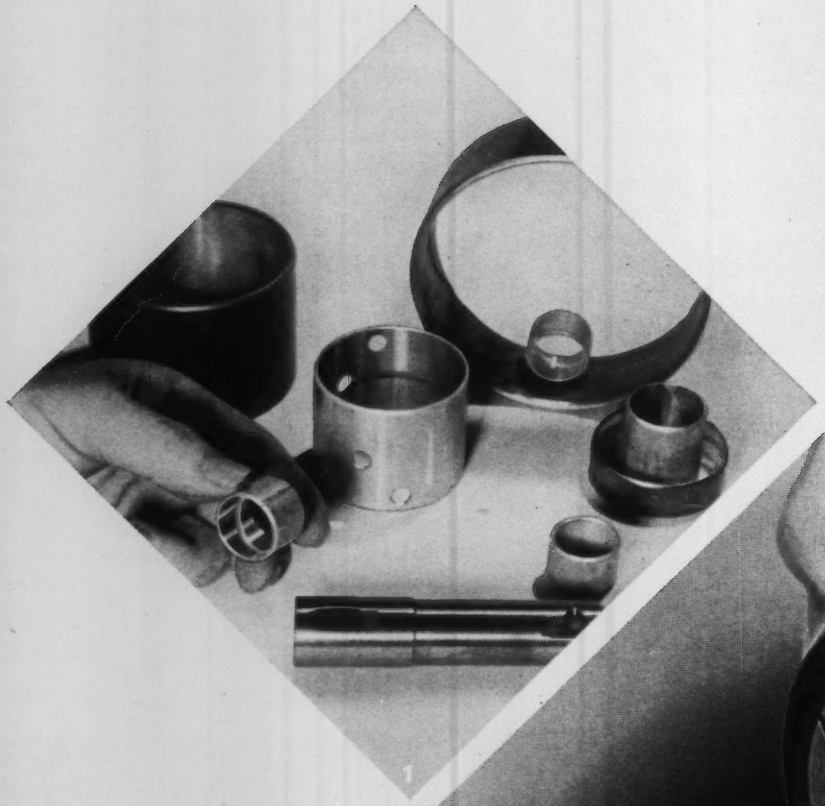
Research-Cottrell provides the most modern and comprehensive engineering and equipment available, based on hundreds of Cottrell installations all over the world.

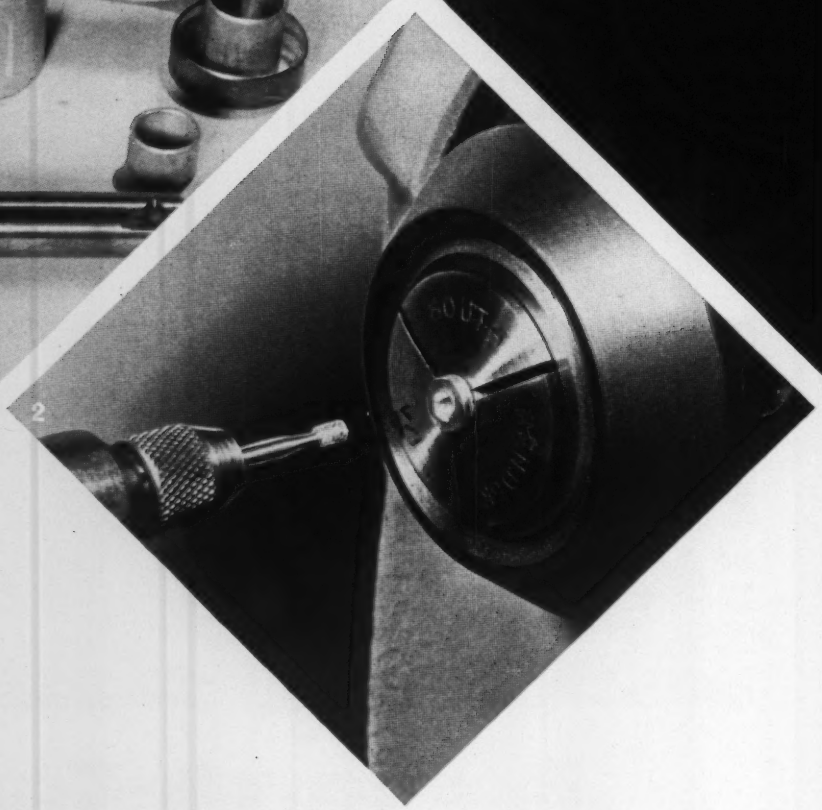


**Research-Cottrell**

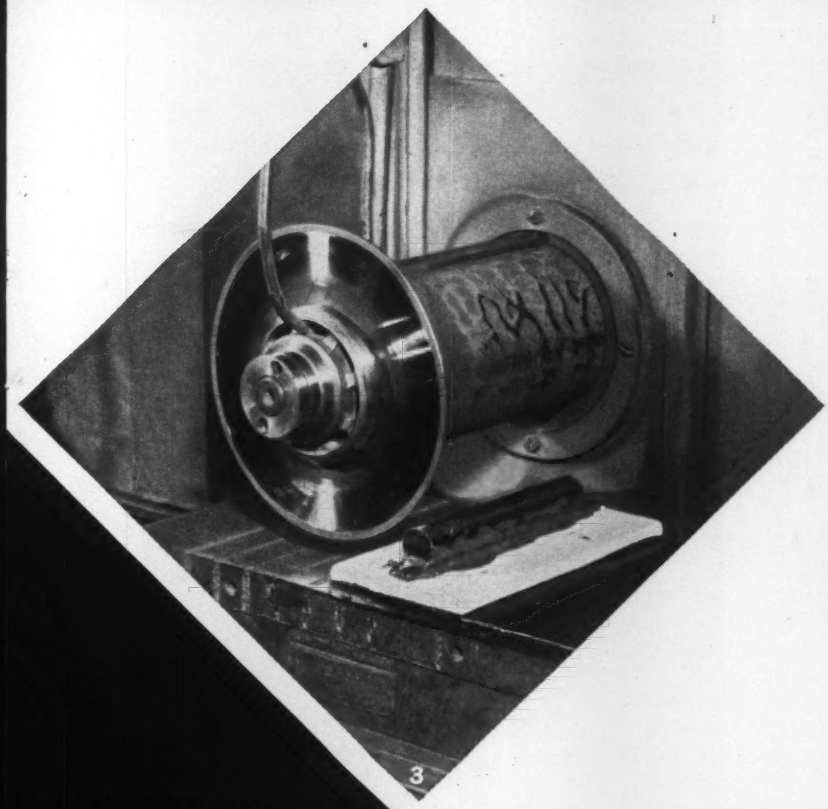
RESEARCH-COTTRELL, INC., Main Office and Plant: Bound Brook, N. J.
Representatives in principal cities of U.S. and Canada

AC-210.





**Industrial Distributors (Sales), Ltd.**



# Look at the materials (and costs) that diamonds can cut

Everybody knows that industrial diamonds are used to grind and sharpen carbide tools. But did you know that diamonds can also cut and polish nonferrous metals like aluminum and bronze as well as glass, germanium, ceramics, marble?

Diamonds handle all of these jobs because only diamonds possess a unique *combination* of properties: excellent cutting ability coupled with fantastic endurance. Result: diamond tools last longer than anything else you can use. Your people spend more time producing, less time changing tools.

If you cut, sharpen, or smooth in your business, you can probably use diamonds to advantage. Test them against the method you're using. You'll find out how efficient—and economical—a diamond can be, especially now.

## Best grit for metal-bond wheels

A new impact crushing method for natural diamonds (developed by the Diamond Research Laboratory in Johannesburg) is producing the strongest and most durable diamond grit ever obtained for metal-bond wheels. Your tool and wheel manufacturer is ready to help you select the diamond tool that's right for *your* job.

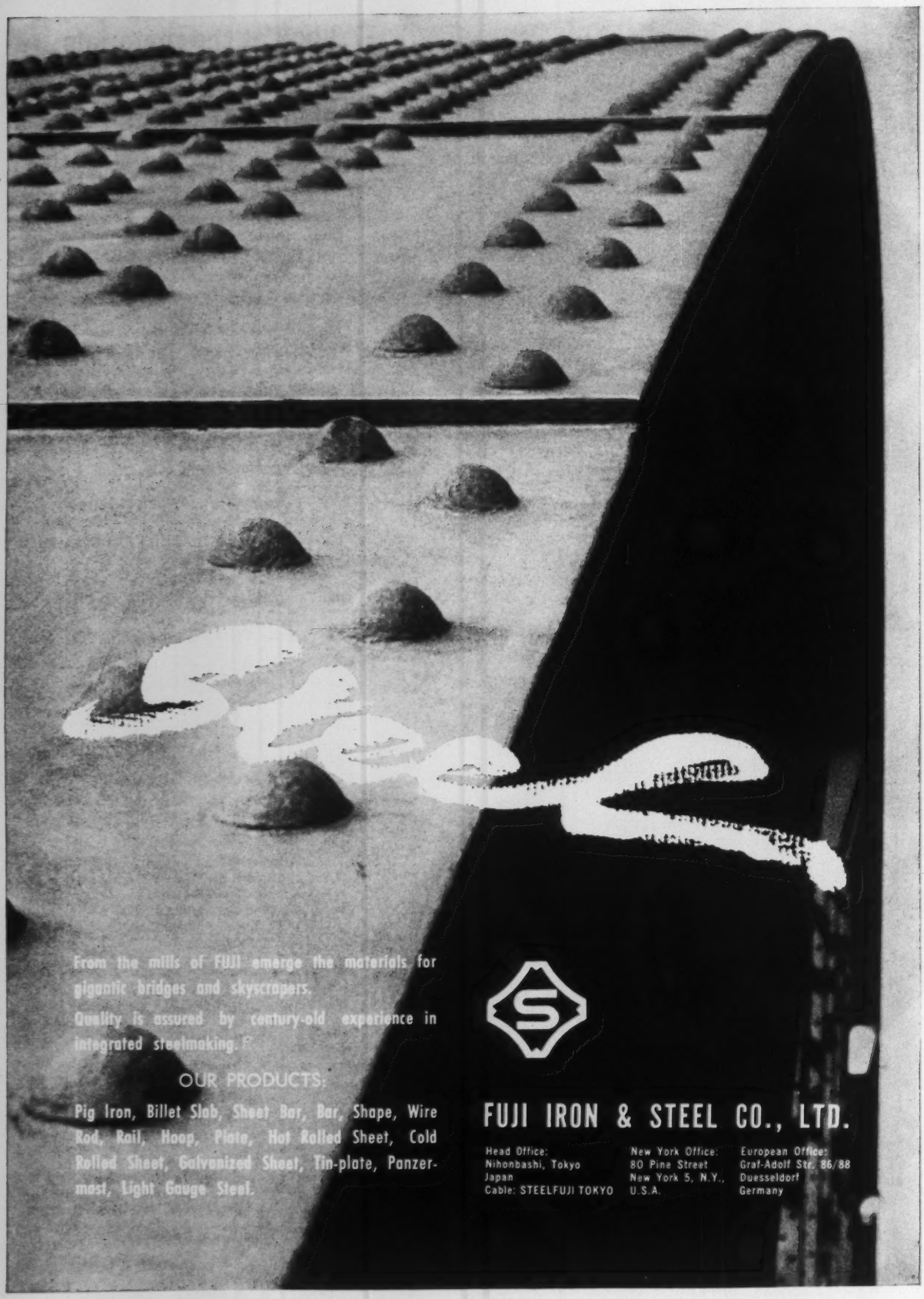
**1** **Bimetal Bushings** *made at Federal-Mogul-Bower Bearings, Inc., Detroit, have steel shells with inserts of sintered bronze, tin, lead or aluminum. Diamond boring machine produces 15,000 in one shift. Inside diameters are finish-machined to tolerances of ±0.0005 inch.*

**2** **Hardened Steel** *is ground with diamond-coated quills for precision grinding of small internal diameters at National Diamond Laboratory, Peekskill, N. Y. Miniature diamond wheels have greater strength and durability than small grinding tools containing conventional abrasives.*

**3** **Germanium and Silicon** *are sliced with diamond wheel at Standard Rectifier Corp., Santa Ana, Calif. Cutters are powdered-metal matrix impregnated with small, blocky natural diamonds. No wear has been visible after months of use.*

**4** **Copper-Plated Rollers** *of cast iron, steel or aluminum for gravure printing are smooth-finished in a single pass with diamond lathe tool at Southern Gravure Service, Louisville, Ky. Surface finish of about 6 microinches results. No coolant is required.*

*Industrial diamonds cut practically everything... especially your production costs*

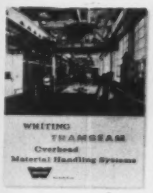

From the mills of FUJI emerge the materials for gigantic bridges and skyscrapers.
Quality is assured by century-old experience in integrated steelmaking.
OUR PRODUCTS:
Pig Iron, Billet Slab, Sheet Bar, Bar, Shape, Wire Rod, Rail, Hoop, Plate, Hot Rolled Sheet, Cold Rolled Sheet, Galvanized Sheet, Tin-plate, Panzermast, Light Gauge Steel.
FUJI IRON & STEEL CO., LTD.
Head Office:
Nihonbashi, Tokyo
Japan
Cable: STEELFUJI TOKYO
New York Office:
80 Pine Street
New York 5, N.Y.,
U.S.A.
European Office:
Graf-Adolf Str. 86/88
Duesseldorf
Germany

# TRAMBEAM® CUTS COSTS BY KEEPING PRODUCTS *ON TRACK*

Here's how The Louis Allis Company—a major motor manufacturer—handles varnish coating of massive stators and stator coils. Units come into the dip tank section shown above from any one of a battery of ovens and from any other part of the plant.

Two transfer cranes, one with a lift section, and connecting spur tracks interlock the entire area into a smoothly operating, trouble-free materials handling unit. No manual, time consuming re-handling of material is required. The product is always ON TRACK with Trambeam.

Trambeam is completely compatible with all other methods of materials handling. Why not have a Whiting man tell you how it can cut costs by reducing wasted effort in your plant? Write: Whiting Corporation, 15601 Lathrop Ave., Harvey, Ill. In Canada: Whiting Corporation (Canada) Ltd., 350 Alexander Street, Welland, Ontario, Canada.




Ask for your copy of Whiting's latest Trambeam bulletin—M-34

**See our catalog in Sweets**

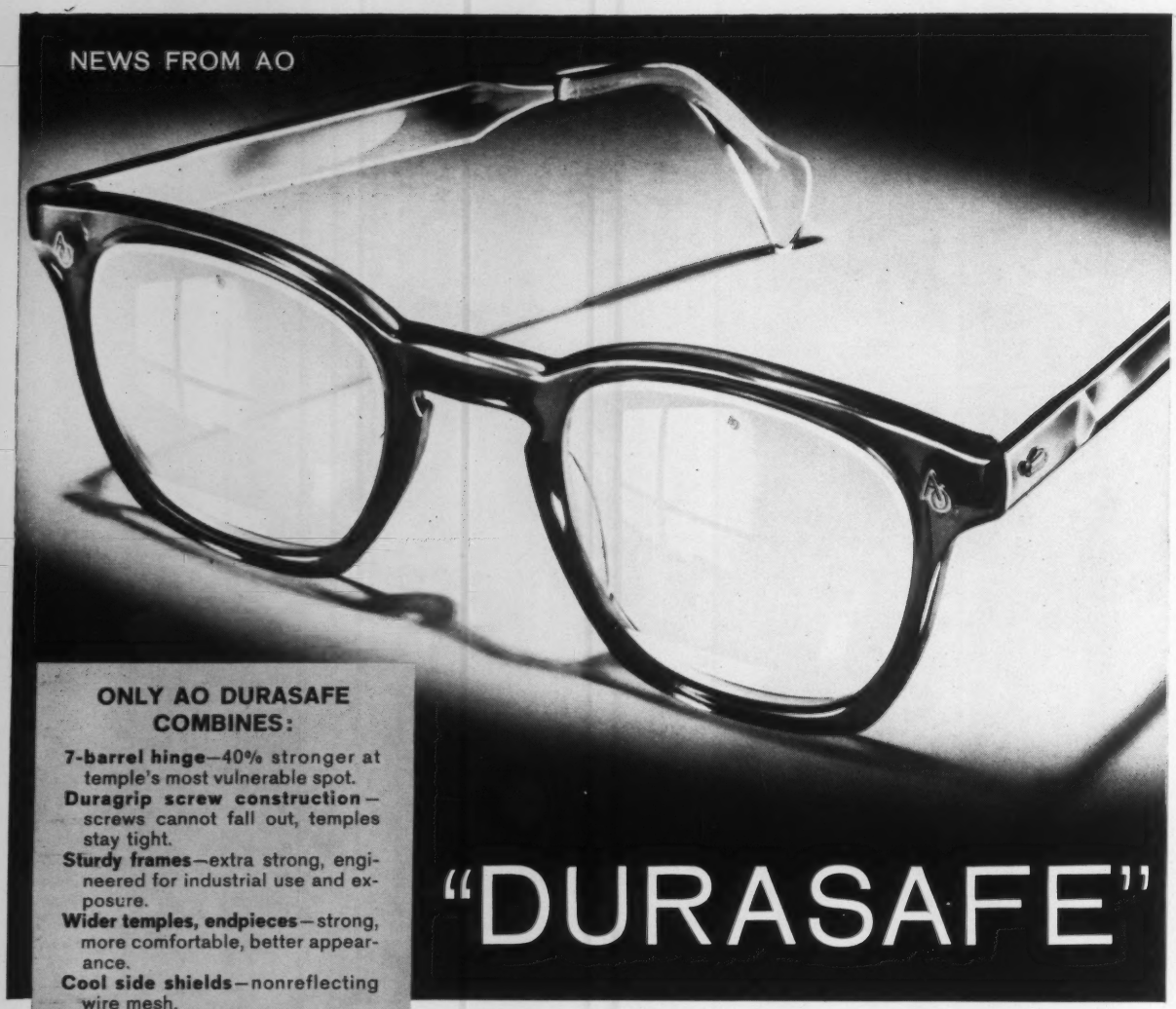
90 OF AMERICA'S "FIRST HUNDRED" CORPORATIONS ARE WHITING CUSTOMERS

TRAMBEAM®

# WHITING

MANUFACTURERS OF CRANES; TRAMBEAM® HANDLING SYSTEMS; PRESSUREGRIP®; TRACKMOBILES; FOUNDRY, RAILROAD, AND SWENSON CHEMICAL PROCESSING EQUIPMENT

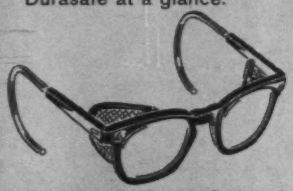
NEWS FROM AO



# "DURASAFE"

**ONLY AO DURASAFE COMBINES:**

**7-barrel hinge**—40% stronger at temple's most vulnerable spot.
**Duragrip screw construction**—screws cannot fall out, temples stay tight.
**Sturdy frames**—extra strong, engineered for industrial use and exposure.
**Wider temples, endpieces**—strong, more comfortable, better appearance.
**Cool side shields**—nonreflecting wire mesh.
**Easy to identify**—AO monogram on frames and lenses identifies Durasafe at a glance.



**TAKE YOUR CHOICE OF**

**Solid colors**
Smoke (F9800SM)
Mahogany (F9800M)
Pink Crystal (F9800PC)
**Two-tones**
Smoke on Crystal (F9800SC)
Mahogany on Crystal (F9800MC)
Black on Crystal (F9800BC)
**Temples**
Plastic comfort cable
Metal core plastic spatula
Aluminum with plastic tip
**Full range, bridge & eye sizes**
**Safety Rx or plano lenses**
**With or without side shields**

## ...the glasses workers wear willingly

Your plant eye protection program's *full* effectiveness is governed by the workers' willingness to wear safety glasses (or goggles) regularly. In the new Durasafe, you have fitting qualities and a choice of colors and combinations that satisfy everyone . . . combined with the latest safety features that mean maximum protection and durability.

This wearer acceptance can be a big factor in preventing costly eye injuries. For the new Durasafe will protect against 80% of the eye hazards in an average industrial plant with a full eye protection program.* For full information on the glasses workers *want and will wear*, call your AO Safety Products Representative, or write for Bulletin S-1013.

*Other types of AO safety goggles are needed to cover special hazards.

*Your Surest Protection . . .* AO SURE-GUARD Glasses

American Optical COMPANY

SAFETY PRODUCTS DIVISION • SOUTHBRIDGE, MASSACHUSETTS

# TENZALOY

## Tenzaloy Aluminum for high-strength castings without heat treatment

When you need a high-strength aluminum casting your alloy should be self-aging Tenzaloy — particularly if you want to avoid heat treatment. *Tenzaloy has this unique combination of properties:*

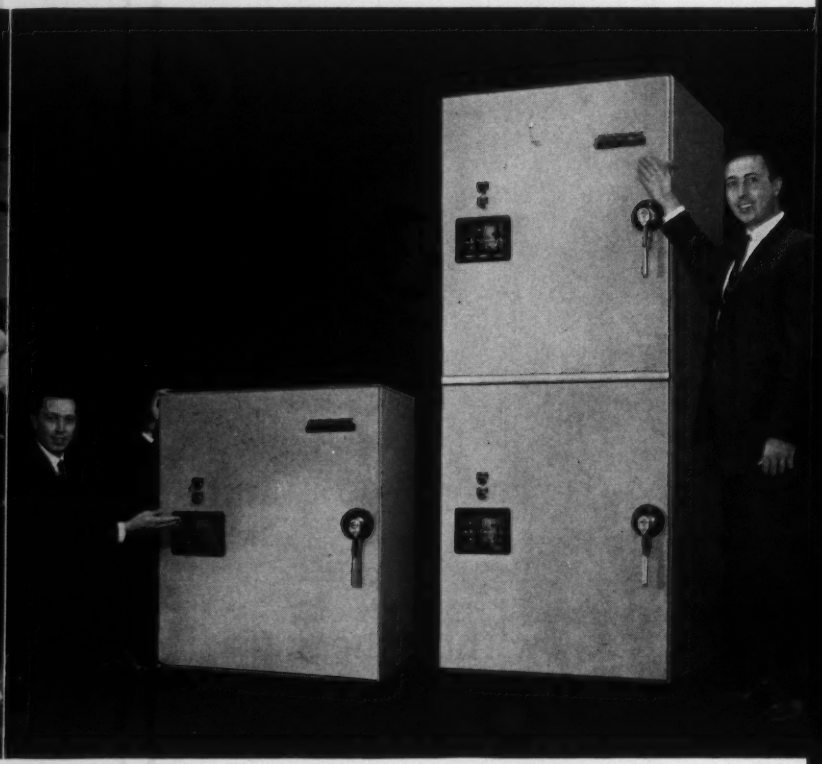
1. High yield and tensile strength
2. Exceptional machinability
3. Remarkable dimensional stability
4. High impact and shock resistance
5. Excellent corrosion resistance
6. Permanent, silvery-white finish

Tenzaloy castability is excellent in green sand, plaster, investment, shell, oil-bonded sand and permanent molds of all kinds. It is particularly suited to designs where load-carrying capacity, impact strength and light weight are essential, and it is used in applications where heat treated aluminum alloys, cast iron or other materials might otherwise be selected.

Write for your copy of Bulletin 103R5 to: Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, N. Y.

ASARCO

# ideas and news:



**Fully adjustable stator blade control:** Extends range of highly efficient axial compressors. Combines ability to meet fluctuating demands at constant speed with basic axial design advantages . . . steam savings of over 10%, and space and weight savings 25 to 50% of that required by comparable centrifugal compressors.

**So low, two fit where one used to go:** This new SpaceMaker control center is the first completely new 2- to 5-kv motor controller in more than a decade. Two-high design can cut floor space requirements in half. Complete drawout construction makes it the safest, most easily accessible controller on the market. New flame-retardent, track-resistant Super Pyro-Shield insulation adds to reliability, reduces size and weight. And, the all-new roll-out contactor is designed to cut maintenance time.

## Which of these productive ideas could be working for you?

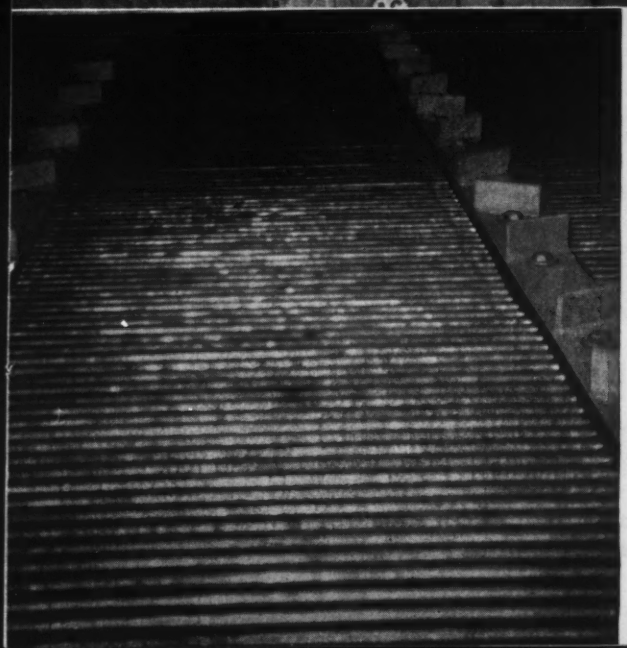
Screens that can't blind. Compressors with adjustable capacity at constant speed. These examples demonstrate the extra value that is standard with Allis-Chalmers . . . the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industrial Equipment Division, 900 S. 70th Street, Milwaukee 1, Wisconsin.

A-1399

*Systemation* is an Allis-Chalmers servicemark. *SpaceMaker* and *Pyro-Shield* are Allis-Chalmers trademarks.

**For quality control . . . lower processing costs:** Systemation engineers at Allis-Chalmers will undertake responsibility for the design of complete operating facilities. Systemation service is based on a thorough understanding of your processing requirements gained from years as a major equipment supplier to your industry. Added is the experience of over 500 successful advanced electronic control systems by Consolidated Systems Corporation, an affiliate company.

**Sixty-eight motors power plating rolls:** When this electrolytic tin line went into operation in 1960, 68 Allis-Chalmers totally-enclosed fan-cooled dc gearmotors powered the plating rolls. Additional Allis-Chalmers motors and supporting motor-generator sets provide power throughout the line. Whether small process line drives such as these, or huge main mill drives, A-C motors have earned a reputation for long life and trouble-free operation.



**Screen moist, sticky ores without blinding:** Allis-Chalmers new loose-rod deck for vibrating screens makes finer separations — down to ⅜ or ¼ in. — at increased capacity and improved efficiency. The rods roll and bounce, freeing themselves of sticky material. Similar cost-saving advantages are also found in A-C hot sinter screens and sizing screens.

**A-C INDUSTRIAL EQUIPMENT DIVISION:** motors, generators, controls, rectifiers, pumps, compressors, grinding mills, screens, industrial systems.

**OTHER A-C PRODUCTS:** thermal, hydro and atomic electrical generating equipment; switchgear, transformers, unit substations; tractors, earth-moving equipment, engines, lift trucks.

# ALLIS-CHALMERS

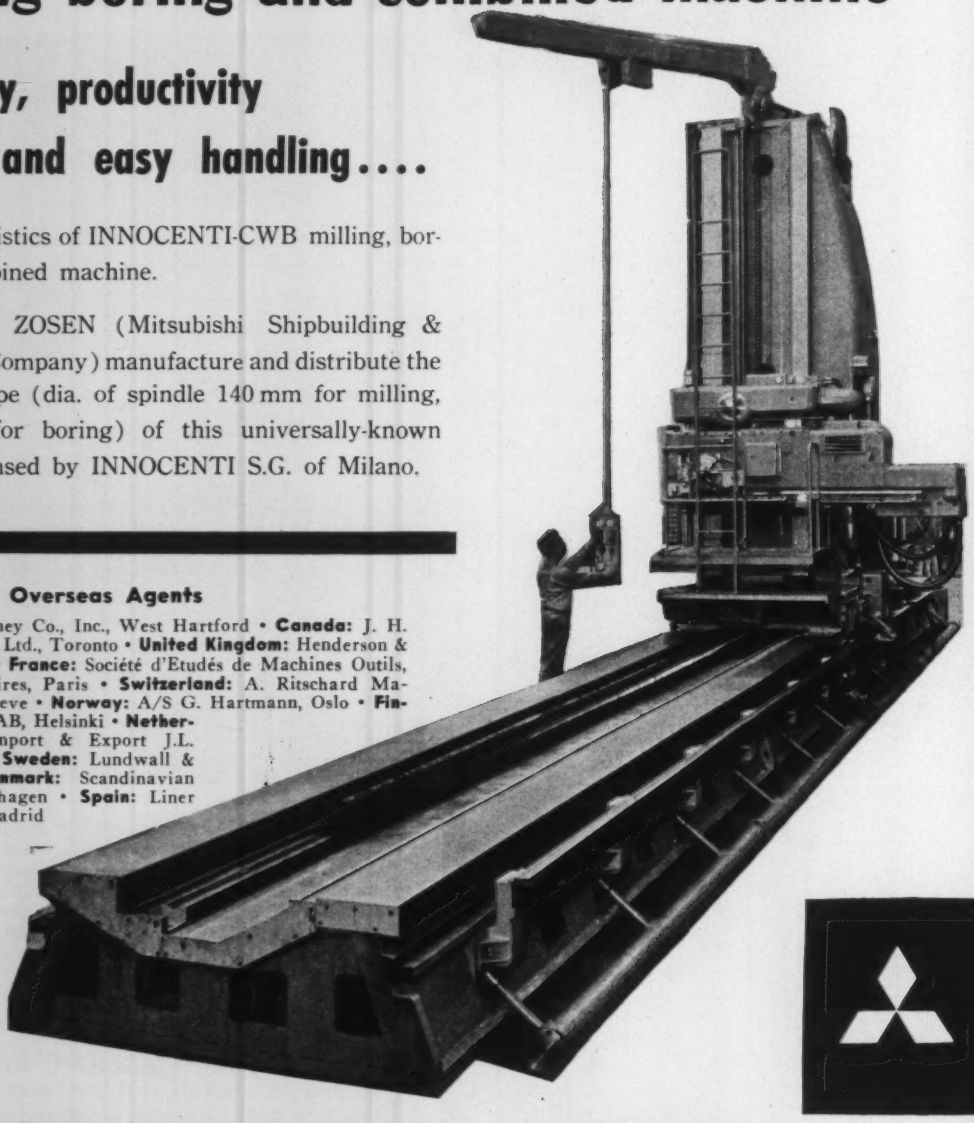
# MITSUBISHI INNOCENTI CWB

# milling boring and combined machine

## Universality, productivity and easy handling....

are characteristics of INNOCENTI-CWB milling, boring and combined machine.

MITSUBISHI ZOSEN (Mitsubishi Shipbuilding & Engineering Company) manufacture and distribute the FA 140/95 type (dia. of spindle 140 mm for milling, and 95 mm for boring) of this universally-known machine, licensed by INNOCENTI S.G. of Milano.



**Overseas Agents**

**U.S.A.:** Pratt & Whitney Co., Inc., West Hartford • **Canada:** J. H. Ryder Machinery Co., Ltd., Toronto • **United Kingdom:** Henderson & Keay, Ltd., Glasgow • **France:** Société d'Etudés de Machines Outils, Outillages et Accessoires, Paris • **Switzerland:** A. Ritschard Machines-Outils SA, Geneve • **Norway:** A/S G. Hartmann, Oslo • **Finland:** OY Machinery AB, Helsinki • **Netherlands:** Technische Import & Export J.L. Bienfait, Asterlaan • **Sweden:** Lundwall & Co., Göteborg • **Denmark:** Scandinavian Phoamix A/S, Copenhagen • **Spain:** Liner Sociedad Anonima, Madrid

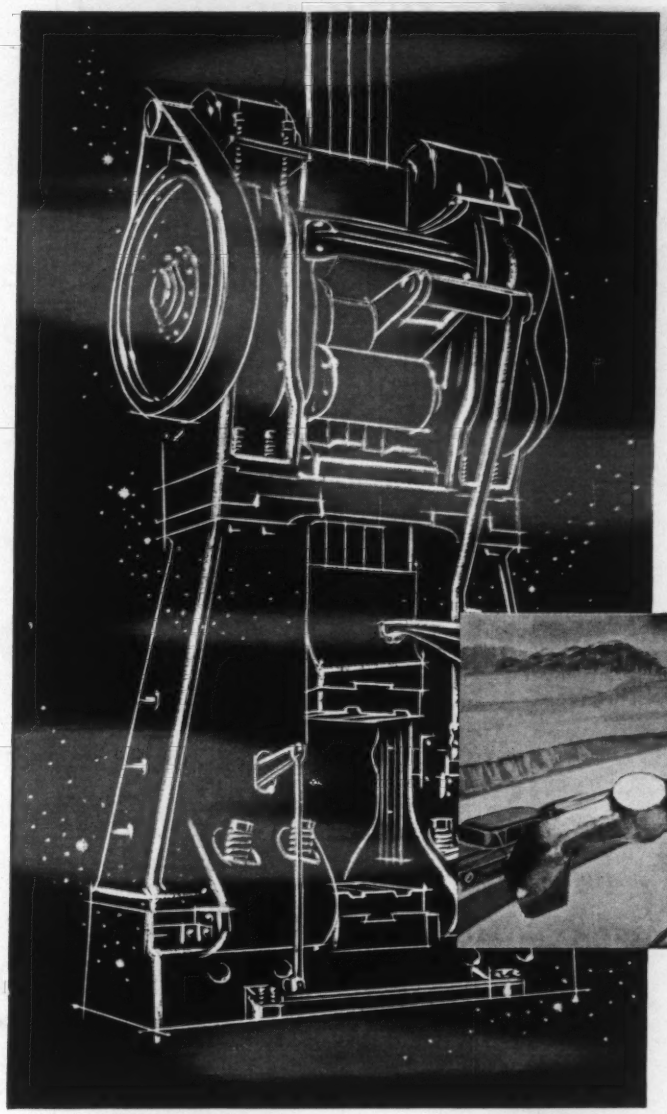
# MITSUBISHI ZOSEN

## (MITSUBISHI SHIPBUILDING & ENGINEERING CO., LTD.)

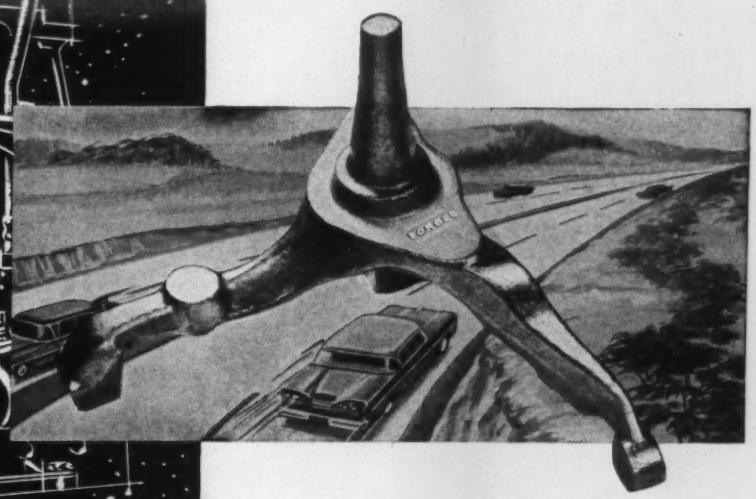
Head Office: Marunouchi, Tokyo, Japan  New York Office: Equitable Bldg., Broadway, New York

Machine tool manufacturing division
**HIROSHIMA PRECISION MACHINE WORKS**

Sole agent
**MITSUBISHI SHOJI KAISHA, LTD.**



# SHOCK-STRENGTH of steering spindle soars by designing it to be forged



*Modern board-lift forging hammer*

By designing front-end spindles to be forged, automobile and truck manufacturers practically eliminate danger of failure of these vital parts, even under sudden turning stress that can reach thousands of foot-pounds.

Start your designs by planning to use forgings everywhere there's a high degree of stress, vibration, shock, or wear. Forged parts withstand them all better than parts made by other fabrication methods. And forgings have no hidden voids to be uncovered after costly machining hours have been invested . . . the hammer blows or high pressures of the forging process compact the *better* forging metal, make it *even better.*

Write for literature on the design, specification, and procurement of forgings.

**When it's a vital part, design it to be** FORGED

**Drop Forging Association • Cleveland 13, Ohio**

*Names of sponsoring companies on request to this magazine.*

*TOTAL JOB ANALYSIS multiplies savings over ordinary cost studies.*

Your company can profit from this dual approach to cost reduction. At the Lockformer Co., Chicago manufacturer of roll forming machinery, hourly out-

# 365%

put of forming rolls (upper right) was increased from 8.6 to 40. A round figure gain of 365%! Other jobs (most of them short runs) showed similar gains. // First, Lockformer's hobs were redesigned to increase machine speed. The roll gear, for example, originally cut with a 2¾" single-thread hob at 204 rpm, now is cut with a triple-thread, 3¼" diam hob at 306 rpm. Feed is the same, but cutting time has been reduced. Second,

cycle time was trimmed by a Barber-Colman No. 16-16 MULTI-CYCLE machine. Combination power vertical feed and automatic cycling reduced approach distance. Rapid traverse of the workslide and hob carriage reduced noncutting time. To sum up– an automatic

# INCREASE

cycling machine with complete general-purpose flexibility was combined with proper hob design to increase productivity 365%, and with better accuracy, finish, and tool life. // Take advantage of a Barber-Colman total job analysis to reduce your costs. A complete cost evaluation . . . developed from your gear prints and production requirements and backed by a machine demonstration in our TEST CENTER (right). Phone your Barber-Colman representative for details.

BARBER COLMAN

*BARBER-COLMAN COMPANY*

610 Loomis Street, Rockford, Illinois

take advantage of the

# NEW PROJECT ALERT RECTIFIER PROGRAM

*Rebuild your old equipment now!*

Now's the right time to let Udylite electrical equipment specialists rebuild your old, inefficient, 6-, 9- and 12-volt UM and UV rectifiers. You can obtain all of the advantages of a completely new silicon unit at a cost just slightly more than a silicon diode replacement kit. With the exception of the transformer, you'll have *a brand new rectifier from top to bottom.*

**NEW, MODERN CABINET** features slotted side panels for easy removal and replacement.

**UNIFRAME CONSTRUCTION** gives increased ruggedness, reduces overall weight.

**NEW DIODE ASSEMBLY** has newly-designed, one-piece, solid copper, finned heat sink and improved, non-aging silicon diodes with ceramic insulation and individual fuse protection.

**NEW VENTILATION SYSTEM** with new fan-housing assembly and permanent, built-in baffling assures highest ventilation efficiency.

**NEW, LOW HEIGHT** saves space. D.C. terminals are located in same relative position, thus new bussing is not required for re-installation.

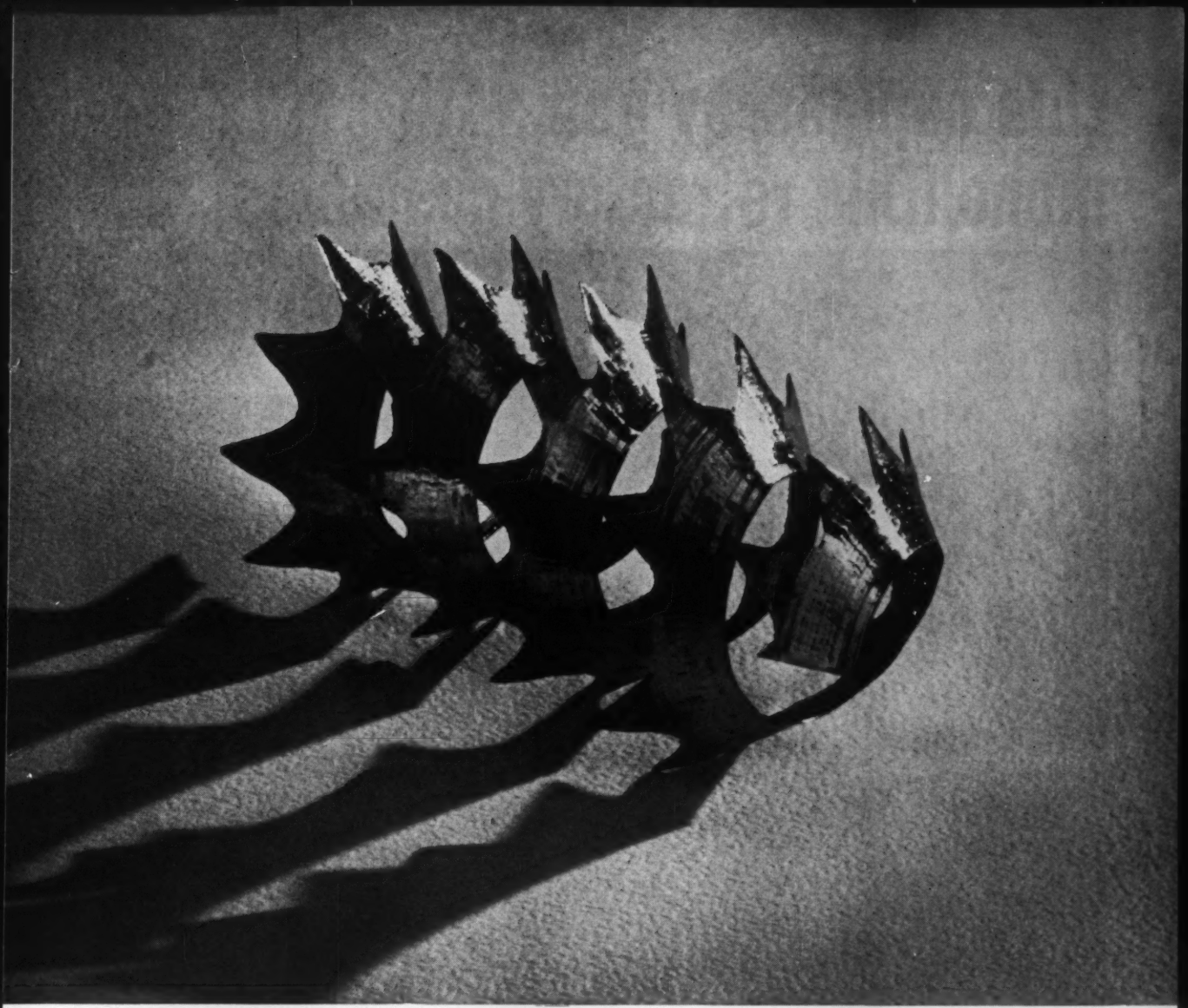
All transformers are full-load tested before and after re-manufacturing. It will pay you to investigate the many benefits of the Udylite Project Alert factory conversion program today. For conversion of other old-style Udylite Rectifiers to economical silicon units, contact your local Udylite Representative.

**SILICON CONVERSION KITS**—Udylite Silicon Diode Kits are also available for UV and UM rectifier conversion right in your plant. A specially fabricated heat sink assembly, complete with diodes and fuses, permits fast, easy installation.

Udylite

**The Udylite Corporation**
**Detroit 11, Michigan**

udylite



Chip – magnified 4 times – produced by machining Waspalloy with Rex 49

# New Rex 49 outlasts other special purpose high speed steels better than 2 to 1

Rex® 49—a new high speed steel that can machine today's "difficult-to-cut" metals *faster and more economically* than existing special purpose high speed steels – is another in the long line of advances and improvements in specialty steels to come from Crucible research.

Crucible laboratory tests indicate that tools made of Rex 49 last as much as 4 times longer than other special purpose high speed steels . . . and it has a base price ⅓ to ½ of these steels.

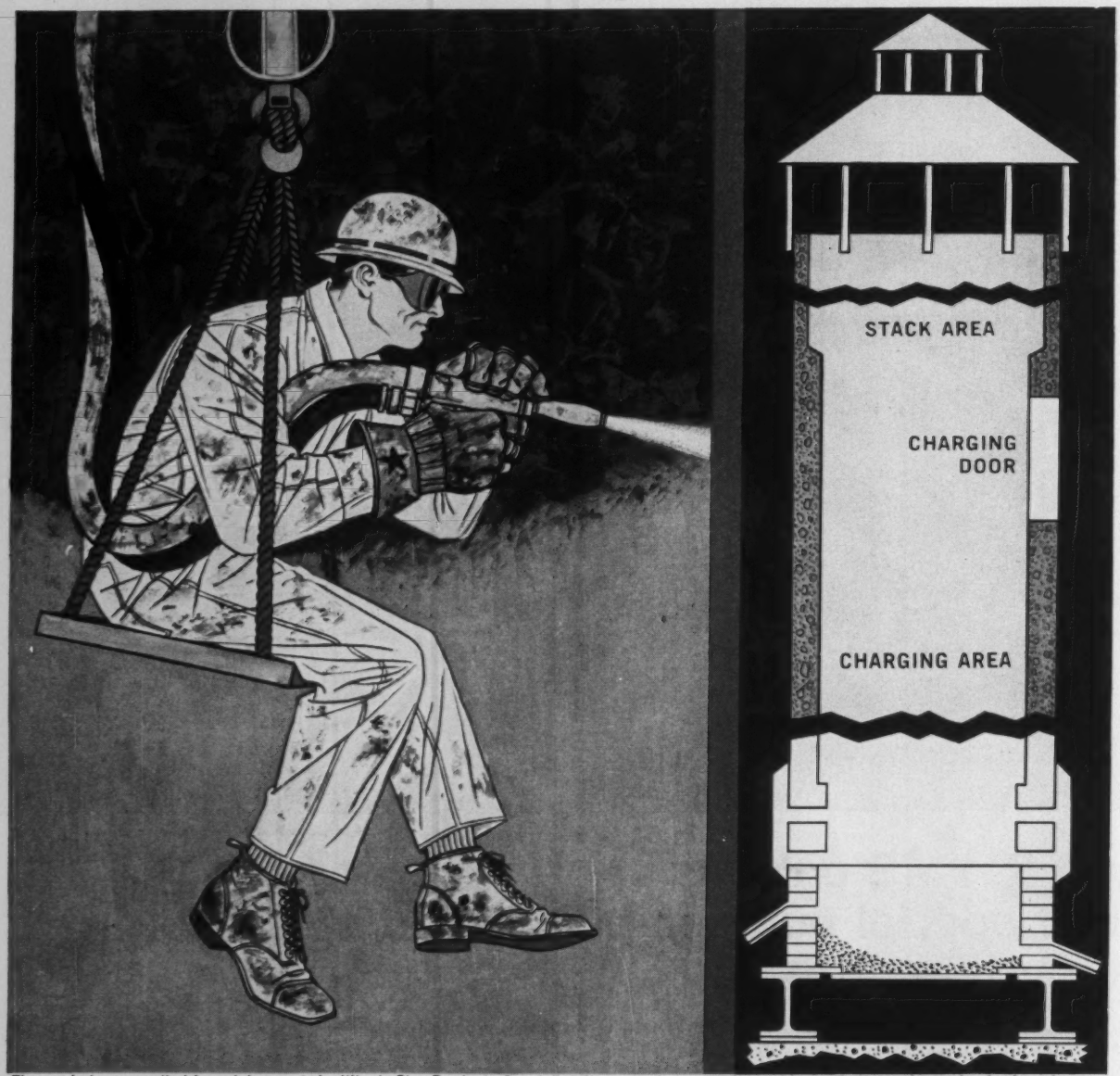
Both laboratory and field reports prove the advantages of Rex 49 for machining hard, tough or abrasive metals, such as heat-treated alloy steels, stainless, titanium, and superalloys. These tests also indicate that Rex 49 has advantages in machining the more conventional metals through increased speeds, feeds and depths of cut — and Rex 49 can be hardened with conventional high speed steel heat treating equipment.

Rex 49 is indicative of Crucible's continuing leadership in the development of improved high speed and tool steels.

For more information, write: *Crucible Steel Company of America, Dept. HF06, Four Gateway Center, P. O. Box 88, Pittsburgh 30, Pa.*

**CRUCIBLE STEEL COMPANY OF AMERICA**

# Line cupolas, by gun, with monolithic refractory castables!




Figures below compiled from job reports by Illinois Clay Products Co., Joliet, Ill., manufacturer of castables and other refractories for foundry use.

Foundries that use castables made with LUMNITE calcium-aluminate cement to line cupolas have cut installation time 75%, reduced refractory costs 43%, and increased lining life 78%.

Gun-applied castables in the charging zone and upper stack of cupolas form a strong, joint-free lining that offers greater resistance to erosion. The concrete lining may be gunned to any thickness, actually helps reinforce the shell, reaches full strength in 24 hours.

Castables for cupola linings are available from leading manufacturers of refractories. For details on the use of LUMNITE cement, write Universal Atlas, 100 Park Avenue, New York 17, N. Y.

**Universal Atlas Cement**
**Division of**
**United States Steel**

"USS" AND "LUMNITE" ARE REGISTERED TRADEMARKS. L-214

OFFICES: Albany • Birmingham • Boston • Chicago • Dayton • Kansas City • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • St. Louis • Waco

# How to automate step by step

Automation means many things to many people . . . ranging from the simple sequencing of individual operations to the completely automatic system.

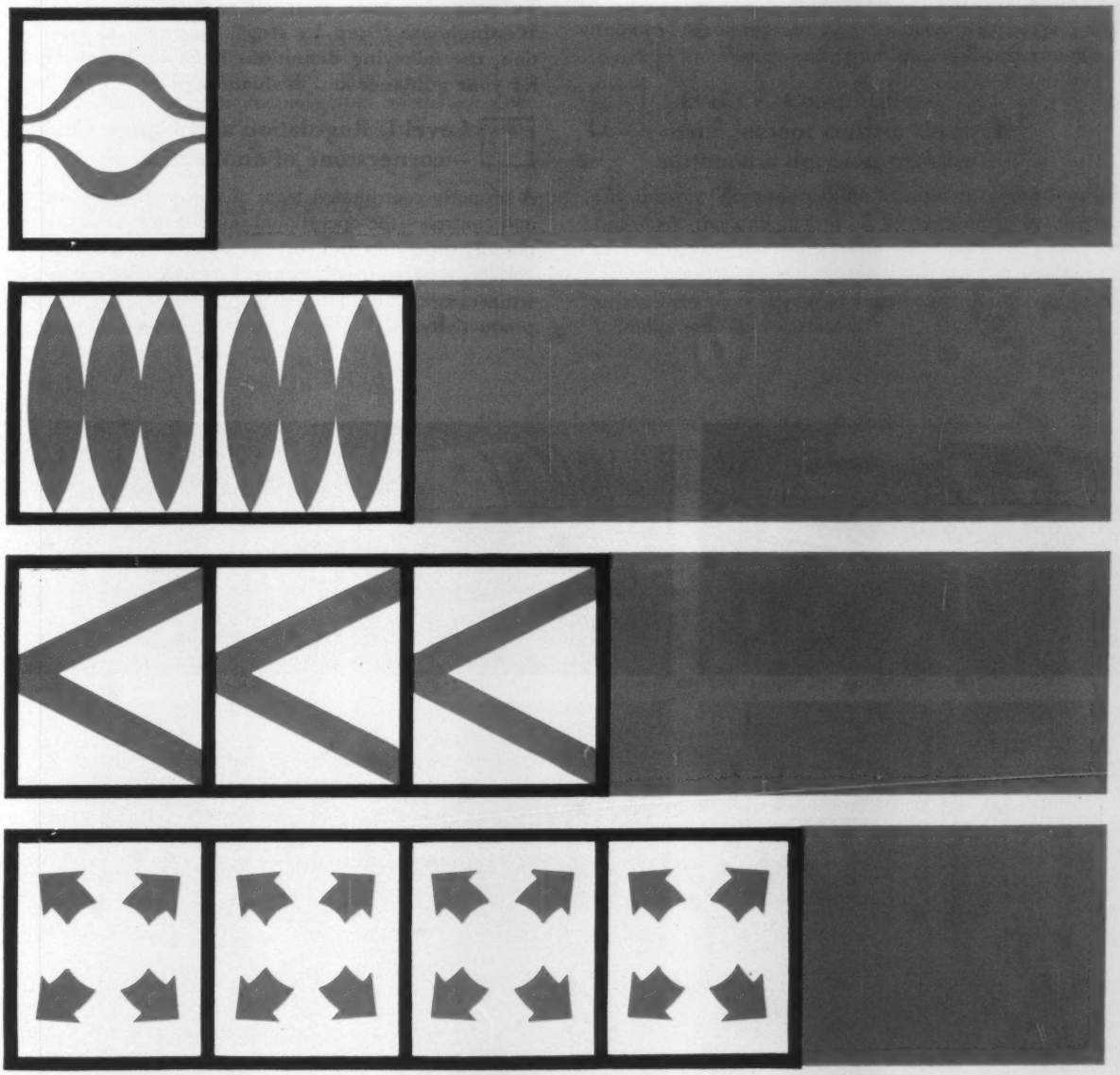
Westinghouse has chosen the term "Progressive Automation" to describe a step-by-step application and coordination of electric drive systems . . . executed in stages that are completely compatible to your cost-reduction, production quality and equipment modernization goals.

Such a step-by-step concept permits you to realize immediately higher mill rates, better steel quality and longer mill equipment life in those individual operations that are initially automated . . . and at the same time, moves you a big step closer to the full profit and production benefits of completely automated facilities.

Westinghouse, the leader in this field, is ready to work with you at whatever level you are currently concerned with . . . from simple process regulation to ultimate continuous decision-making computer control.

What level of Westinghouse's "Progressive Automation" meets your current needs best? Let's examine the definitions on the following pages . . .

**Westinghouse**



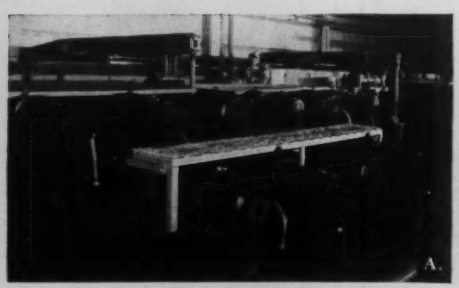
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

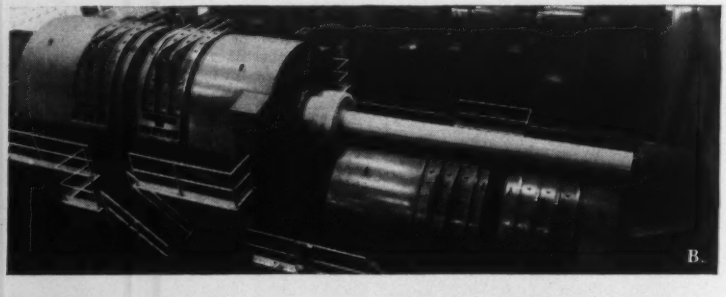
# Westinghouse can help you plan the levels best for you . . . apply them as fast as you want

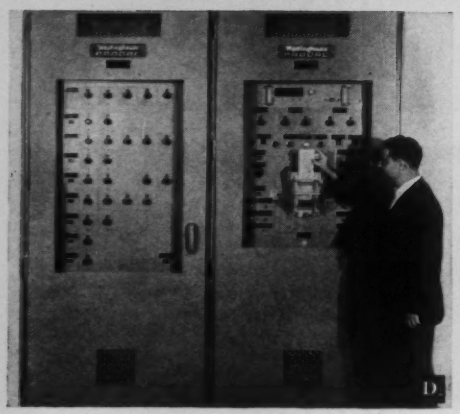
**To properly relate your current operations to the Westinghouse "step by step" approach to automation, the following definitions have been developed for your guidance and evaluation:**

## Level I. Regulation and Gauge Control —cornerstone of automation

A properly coordinated team of power supplies, motors and controls—the operational muscles and brains—continually supervises and corrects process variables such as voltage, tension, speed, torque, position, dimensions and temperatures . . . for better product quality, greater productivity.


A.


B.


D.

E.

3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4
2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2

### Level II. Programming—the right action at the right time automatically

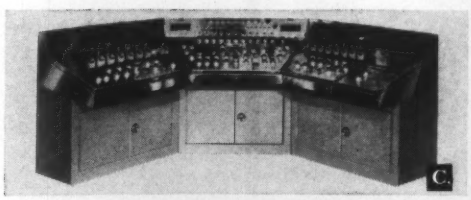
Pre-selection, by means of information contained on punched cards, tapes or manual setups, of the sequence of events and information needed by the regulating system, to control the process.

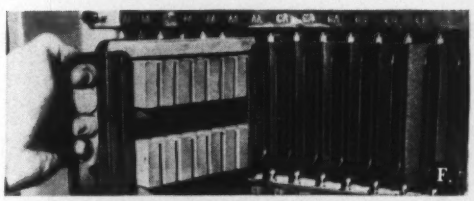
### Level III. Data Logging—fast, precise information

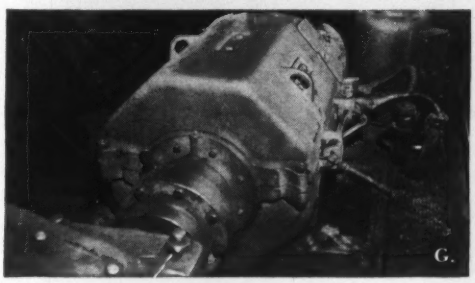
Automatic collection and storage of operating and process information for use when needed—in the form needed. Data logging and display can provide immediate production data for quality control, etc., can record information required to re-program, and can operate as part of a computer in monitoring and optimizing mill performance.

### Level IV. Computing—management control through automatic decision making

Continuous decision-making computer control which optimizes the mill operation by constantly monitoring and correcting the programming and regulatory systems. These corrections are required because of changes in process elements, environmental conditions, equipment loading, and other variables.


C.


F.


G.

### Westinghouse products permit you to realize optimum results at every level of automation

**A.** Westinghouse Life-Line® motors and Moduline® gearing installed in cleaning section of 50-inch continuous annealing line.

**B.** Mill muscles are dependable Westinghouse motors with exclusive Thermalastic® insulation on armatures. This 12,000-hp twin drive is conservatively rated . . . designed for rugged rolling mill duty.

**C.** Typical operator's control pulpit for computer controlled mill.

**D.** Input portion of data accumulation system with manual switches on left—punched card reader on right.

**E.** Complete automatic mill operation is possible with Westinghouse on-line industrial Prodac* control computer.

**F.** Prodac module, representing a circuit function, is easily accessible for removal or replacement.

**G.** Westinghouse heavy-duty d-c mill motors provide power for toughest applications. On steel mill screwdowns, improved field coil design adds more copper for greater capacity and longer life.

For other considerations affecting your use of Westinghouse *Progressive Automation*, see the next page . . .

*Trademark

Westinghouse

# How to apply Progressive Automation to your mills

Exactly where and how can you begin to blue-print your over-all automation plan that will reap all these benefits for your production? The best answer is to begin with the best qualified scource: Westinghouse, who has designed, built and installed more automatic production systems in steel mills than any other manufacturer.

## Westinghouse—one source, one responsibility

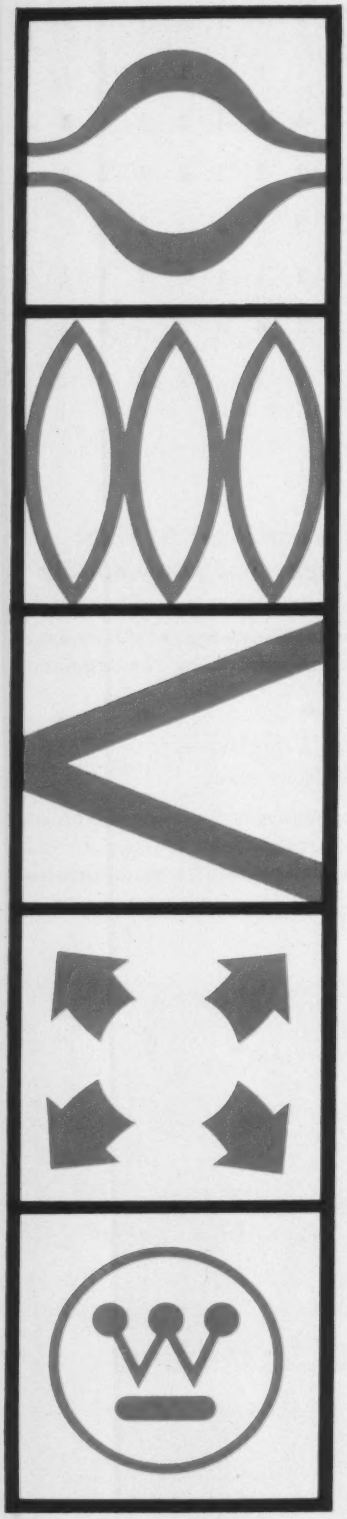
Westinghouse experience, facilities, engineering talent and equipment add up to your assurance of:

1. A sound analysis of your automation needs to determine the automatic systems best suited to your processes.
2. A coordinated systems approach of motors and controls, thoroughly engineered and completely tested, which integrates the stages of automatic production you need.
3. An automatic control system designed for application to your mill in line with the Westinghouse concept of *Progressive Automation.*
4. The use of the latest automation techniques and components—all adaptable to future developments and needed expansion.
5. A single source, a single responsibility for complete automation systems and related electrical equipment.

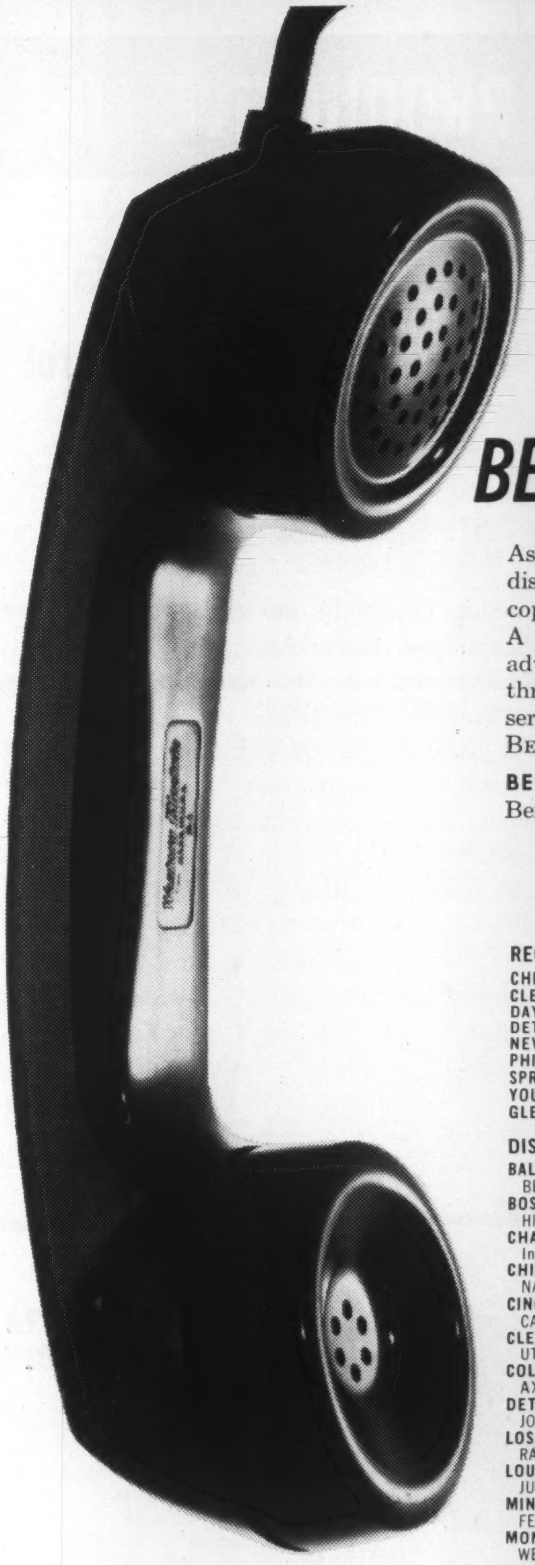
These complete Westinghouse facilities are available to you. Call your nearby Westinghouse representative, or write Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania.

*You can be sure . . . if it's Westinghouse*

Westinghouse



**Interested in more information** on Westinghouse Progressive Automation for the steel industry? Write for B-8220, a complete set of new brochures describing Automation "steps" in detail as they relate to steelmaking operations. You can reserve a set for your use by indicating your area of interest on your company letterhead and mailing it to: Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.



# JUST A FEW WORDS

# WILL BRING YOU

# *BERYLCO* ALLOYS and SERVICES

Aside from their unique combination of desirable properties, a distinct and important advantage in using BERYLCO beryllium copper alloys is their easy availability. It's the same with service. A phone call or conversation can often help you use BERYLCO advantages better . . . cut waste . . . save time and effort. These three things—product advantages; quick, easy availability; prompt service by highly skilled and experienced men—have made BERYLCO alloys first choice of industry.

**BERYLCO PRODUCTS:** Beryllium Copper and other alloys
Beryllium Metal • Beryllium Oxide

**TECHNICAL SERVICE CENTERS AND DISTRIBUTORS NOW SERVING INDUSTRY THROUGHOUT THE U.S.**

**REGIONAL OFFICES:**

**CHICAGO:** ANdover 3-3353
**CLEVELAND:** ACademy 1-2929
**DAYTON:** BAldwin 8-1496
**DETROIT:** CRestwood 8-9300
**NEW YORK:** MUrray Hill 9-5974
**PHILADELPHIA:** LOcust 8-2071
**SPRINGFIELD:** REpublic 4-7581
**YOUNGSTOWN:** RIverside 6-2214
**GLENDALE, CALIF:** CHapman 5-5684

**DISTRIBUTORS:**

**BALTIMORE** Brass & Copper Supply Co., Inc.
BElmont 5-1500
**BOSTON** Eastern Metal Mill Products Co.
HIghlands 2-5900
**CHARLOTTE** Brass & Copper Supply of Carolina, Inc. FRanklin 5-5508
**CHICAGO** Guardian Metal Sales Inc.
NAtional 2-5800
**CINCINNATI** Williams and Company, Inc.
CApital 1-3000
**CLEVELAND** Williams and Company, Inc.
UTah 1-5000
**COLUMBUS** Williams and Company, Inc.
AXminister 4-1623
**DETROIT** Meier Brass & Aluminum Co.
JOrdan 6-3902
**LOS ANGELES** The E. Jordan Brookes Co., Inc.
RAymond 3-8431
**LOUISVILLE** Williams and Company, Inc.
JUniper 3-7781
**MINNEAPOLIS** Eiler Equip. Co.
FEderal 9-9226
**MONTREAL** Peckover's Ltd.
WEllington 3-6717
**NEW YORK** New York Brass & Copper Co., Inc.
New York City: GRamercy 7-5400
Hillside, N.J.: WAverly 6-5300
**PHILADELPHIA** Brass & Copper Sales, Inc.
GLadstone 7-2500
**PITTSBURGH** Williams and Company, Inc.
CEdar 1-8600
**ROCHESTER** Ontario Metal Supply Co., Inc:
HAmilton 6-1630
**SAN FRANCISCO** The E. Jordan Brookes Co., Inc. YUkon 6-2974
**SEATTLE** James J. Backer Co.
ATwater 3-6470
**TORONTO** Peckover's Ltd.
ROger 2-8272

**AGENTS:**

**CHARLOTTE 7, N.C.** W. K. Hile
P.O. Box 6165, FRanklin 7-5062
**LOS ANGELES 16, CALIFORNIA**
The E. Jordan Brookes Co., Inc.
6601 Telegraph Road, RAymond 3-8431
**MINNEAPOLIS 15, MINN.** Eiler Equipment Co.
1107-09 South 2nd Street, FEderal 9-9226
**MONTREAL, CANADA** Peckover's Ltd.
2052 St. Catherine Street West.
WEllington 3-6717
**SAN FRANCISCO 5, CALIFORNIA**
The E. Jordan Brookes Co., Inc.
571 Howard Street, YUkon 6-2974
**SEATTLE, WASHINGTON** James J. Backer Co.
221 West Galer St., ATwater 3-6470
**ST. LOUIS 15, MISSOURI**
Joseph A. Crowe & Associates
1221 Laredo Street, SHerwood 1-6423
**TORONTO, CANADA** Peckover's Ltd.
115 McCormack St., ROger 2-8272

BERYLCO®

## THE BERYLLIUM CORPORATION

P. O. Box 1462, Reading, Pennsylvania • Phone WAlker 9-0781

# INDUSTRY'S MOST PRODUCTIVE LINE

## CP . . . pioneer in "One-Shot" Torque Control Tools for Threaded Fastener Driving

Chicago Pneumatic has maintained industry leadership in the development of Torque Control Tools since the first "one-shot" screwdriver was announced in 1954.

If you drive threaded fasteners, there's a CP Screwdriver, Nutrunner, Multi-Runner or Impact Wrench to meet your production line problems.

Fast, accurate driving can save you as much as 75% in time . . . hold rejects to a minimum. Shown here are some of the latest CP tools for threaded fastener driving . . . *industry's most productive line.* Let our Torque Control Specialists help solve your fastener driving problems. *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

**TORQUE ANALYZER FOR "ONE-SHOT" TOOLS**

provides a fast and simple method for testing and calibrating torque control tools. For fasteners as large as 5/16". Maximum capacity: 200 inch-pounds.

# OF SCREWDRIVERS AND NUTRUNNERS

## NEW DIAL TORK NUTRUNNER

adjustable at the bench to meet a variety of torque specifications on the same job. So accurate it eliminates final tightening with a hand torque wrench. Capacity: #12 to 5/16" machine screws. Adjustable from 50 to 180 inch-pounds.

## MICROMETER TYPE TORQUE SELECTOR

lets operator "dial-in" the torque he needs for each size of fastener.

## "ONE-SHOT" TORQUE CONTROL SCREWDRIVERS

feature the famous CP "one-shot" clutch and silent exhaust. Capacity: #4 to 1/4" machine screws. Adjustable from 7 to 100 inch-pounds.

## "JOLT-FREE" TORQUE CONTROL ANGLE NUTRUNNERS

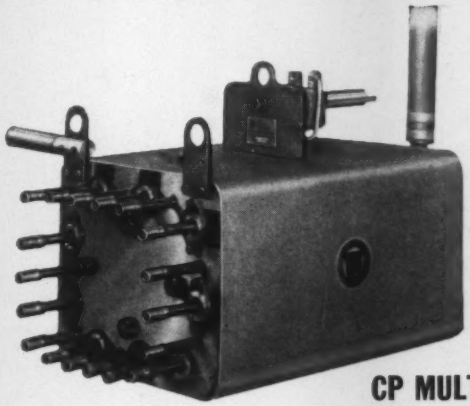
Great time-savers for hard-to-reach jobs. Range of torque adjustment: 6 to 70 foot-pounds.

## TORQUE CONTROL IMPACT WRENCHES

Recommended where torque limits are critical. Sensing mechanism cuts-off tool air supply the instant specified torque is reached. Capacity to 1 1/8" bolt size. Range of torque adjustment: 12 to 1000 foot-pounds.

## NEW CP-606 IMPACT WRENCH

...a real powerhouse. Gives fast rundowns...loosens frozen nuts or bolts fast. Capacity: 3/4" square drive; 3/4" bolt size.



## CP MULTI-RUNNERS

drive every fastener "just right." Husky motors and "one-shot" clutches insure proper tightness, eliminate work spoilage.

## NEW CP-6020 IMPACT WRENCH

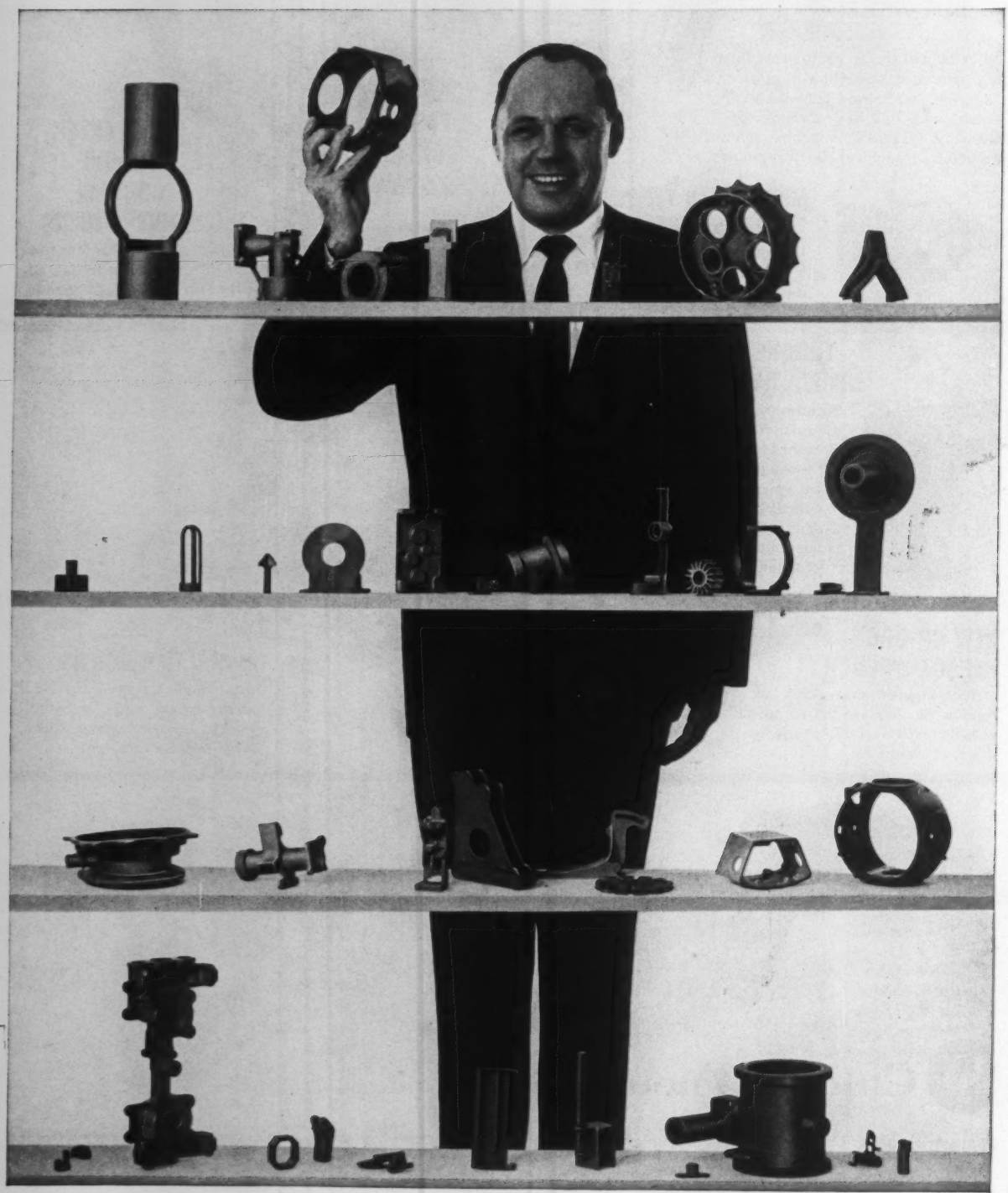
Hand-sized, but a man-sized performer, this 1/4" bolt size capacity tool packs a fist full of power. 8 models with lever or offset handle. 3/8" square drive, or 3 sizes of hex slip chucks: 1/4", 5/16" and 7/16".

**Chicago Pneumatic** *8 East 44th Street, New York 17, N. Y.*

PNEUMATIC TOOLS • ELECTRIC TOOLS • AIR COMPRESSORS • DIESEL ENGINES • HYDRAULIC TOOLS • AVIATION ACCESSORIES

## Because we've always

# WE'VE BECOME THE BIGGEST IN



## welcomed "little" jobs, too–

# THE INVESTMENT CASTING FIELD...

### ...and it makes good sense both for Arwood and its customers

No investment casting job has ever been or ever will be too small for us.

We don't have any "sidelines" nor is investment casting only a sideline with us. It is the "be-all and end-all" of our economic existence.

AS A RESULT: anybody–and we mean precisely that–*anybody* who suspects, thinks, feels or believes that an investment casting will help him solve a design or production problem gets the unqualified, undivided attention of the top talent we have to offer–from the trained field engineer in his territory, our design engineers, our estimating staff, our tooling men, and our production specialists. No one of these groups cares whether your order is for 50 parts or 100,000. If they accept the order, they want it handled to or above "specs"–preferably above.

Why? Simply because these men are dedicated to producing the finest that the investment casting process can deliver in any design, in any castable alloy (we cast any that can be), and in prototype quantities so small that it might surprise you.

This attitude of theirs is far from philanthropic. From an accountant's eye view, they realize full well that your "little ones" may soon grow up and become big ones.

And when they do, Arwood is ready . . . more so than any other investment caster. In fact, we can take in stride all the volume that's required. Our five plants, extending from coast to coast, each with its own research, tooling, quality control and production facilities, can handle the biggest job you can offer.

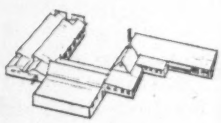
In short, once the prototype or experimental phase is completed, Arwood can give you the quar tity production you need, *and* deliver it when you need it.

*What more can we say?* We can only sum it up by saying this – If you have a "difficult" part remember this: most "difficult" components, no matter what the alloy or quantity, might well be produced as an Arwood investment casting . . . and the cost is often extremely low, compared with conventional methods.

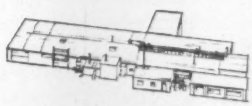
On the other hand, if we can't do it–and do it economically – we'll be the first to tell you so – immediately. We'd rather lose an order than a customer. As you can count on Arwood, you can count on that. Try us and see.

ARE YOU *REALLY* UP-TO-DATE ON WHAT INVESTMENT CASTING CAN DO? A lot of over-optimistic information has been disseminated in the past. Our 48-page "Practical Guide" gives forthright answers on what to expect, and, equally important, what *not* to expect. It tells how to save money by designing for the process, and also gives complete tables on the properties of castable alloys. It's yours for the asking.

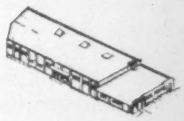
BROOKLYN



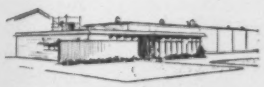
TILTON



GROTON



LOS ANGELES



LA VERNE

**Machine the simple . . . cast the complex**

A complete service from design through tooling, production and finish machining. Seventy-one engineering representatives from coast to coast.

**arwood**

**ARWOOD CORPORATION** • 327A West 44th Street, New York 36, New York

PLANTS IN BROOKLYN, N. Y.; TILTON, N. H.; GROTON, CONN.; LOS ANGELES AND LA VERNE, CALIF.

*Three manufacturers with similar products—*

# There are 57 different Bonderites for metal

## *one of them is the right paint base for you*

Parker long ago realized that any "universal" phosphating treatment would at best be a compromise. A "universal" treatment can't possibly meet the individual conditions and requirements in any one plant as exactly as can a Bonderite that is formulated with that plant's finish line needs in mind.

Parker has many phosphating treatments (38 of them for steel alone), has trained its representatives to match the right Bonderite to a customer's total requirements, and invests hundreds of thousands of dollars in research and development to keep ahead of the ever-changing finishing demands of modern industry.

Don't compromise on quality with a "universal" treatment when Parker can give you a *Bonderite* that's right for *you*.

PROTECTED BY Bonderite PARKER RUST PROOF CO. QUALITY CORROSION RESISTANT

**Parker Rust Proof Company**
2197 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base • BONDERITE and BONDERLUBE aids in cold forming of metals • PARCO COMPOUND rust resistant • PARCO LUBRITE—wear resistant for friction surfaces • TROPICAL—heavy duty maintenance paints since 1883

Since 1914—Leader in the field

*Bonderite, Bonderized, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

**Reliable Rodney asks:**

# NEED *Stainless Steel* PRECISION GAUGE THIN STRIP OR FOIL?

**SPECIALISTS IN CLOSE-TOLERANCE THINNESS**

Rodney concentrates its entire efforts, research and production, toward furnishing super thin, extra wide, cold rolled precision gauge strip in all tempers and finishes. With the entire capacity of the plant and personnel devoted exclusively to this specific area, Rodney has acquired a wealth of "know-how", manufacturing experience, quality control, and application knowledge . . . ready for your use!

**STAINLESS STEEL STRIP** — All Alloys

Widths — ⅛" to 24" Gauges — .012" to .0003"
All Tempers and Finishes.

Rodney furnishes Stainless Steel Strip in all alloys, but specializes in Types 301, 302, 304, 305, 316, 321, 347, 17-7PH, PH15-7MO, 410 and 430, the most commonly used. Rodney's unique ability to produce strip in gauges as thin as .0003" and as wide as 24" makes, in effect, a new kind of material available to design engineers and fabricators. Rodney furnishes strip in all finishes to meet your requirements.

In many applications, Rodney's bright annealed stainless steel makes polishing unnecessary. For example, 300 Series Stainless Steel is available in dead soft temper with a mirror finish on both sides.

For high tensile strength applications material can be furnished approaching 300,000 PSI. Intermediate tempers are also available. Thickness tolerances, when required, can be held to within ±3% of gauge even across the widest strip.

**SPECIAL ALLOYS**

Exotic metals, high temperature and other special alloys for space age applications are regularly rolled to exacting specifications by Rodney. Rodney's laboratory is fully equipped with the latest instruments for mechanical and chemical testing, and Rodney's experienced research and development personnel are always available for consultation on your special problems.

**ALUMINUM ALLOYS AND CARBON STEEL STRIP**

Precision processed to exacting specifications on request.

**SPECIALTY CUSTOM ROLLING**

Rodney will work with you on special super thin rolling of all metals, pure or alloy, within the general range of .0003" to .005" thickness and in widths up to 12½".

- **PRECISION ROLLING**
- **RANGE OF MATERIALS**
- **QUALITY CONTROL**
- **HIGH FINISH**
- **CONTROLLED HEAT TREATING**
- **ON TIME DELIVERIES**
- **ACCURATE SLITTING**
- **COMPLETE RESEARCH AND ENGINEERING FACILITIES AND SERVICES**

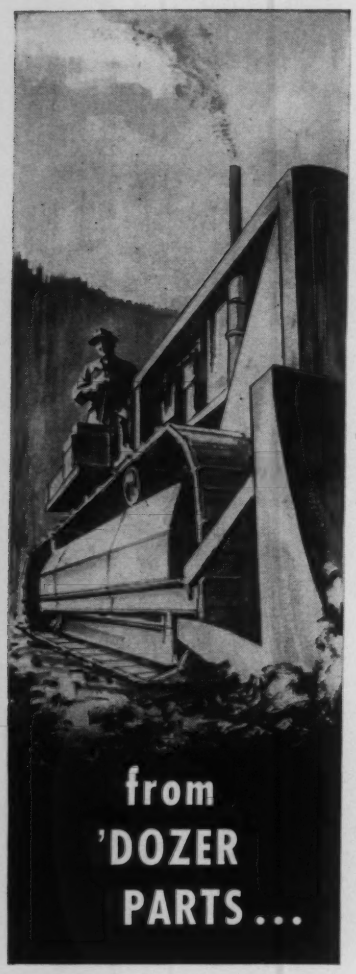
**RODNEY OFFER**

Free bulletin describes Rodney services . . . production, delivery, laboratory, quality control, and ordering information. Just drop us a note on your letterhead.

**RODNEY METALS, INC.**
Mill: Rodney French Blvd., New Bedford, Mass.

RODNEY ROLLED IS QUALITY CONTROLLED

Executive Offices: 261 Fifth Avenue, New York 16, N. Y.
West Coast Office & Warehouse: 5462 East Jillson Street, Los Angeles 22, Calif.



# V-R FIRST CHOICE of more and more industries

V-R Cutting Tool Materials are used throughout the heavy equipment industry to machine components for powerful earth movers, railroad cars, huge trucks — almost any field you can imagine. A complete line enables V-R to supply just the right tool for the job, whether it is taking a rough cut on giant work pieces or a precise finishing cut on parts requiring a superior micro-inch surface.

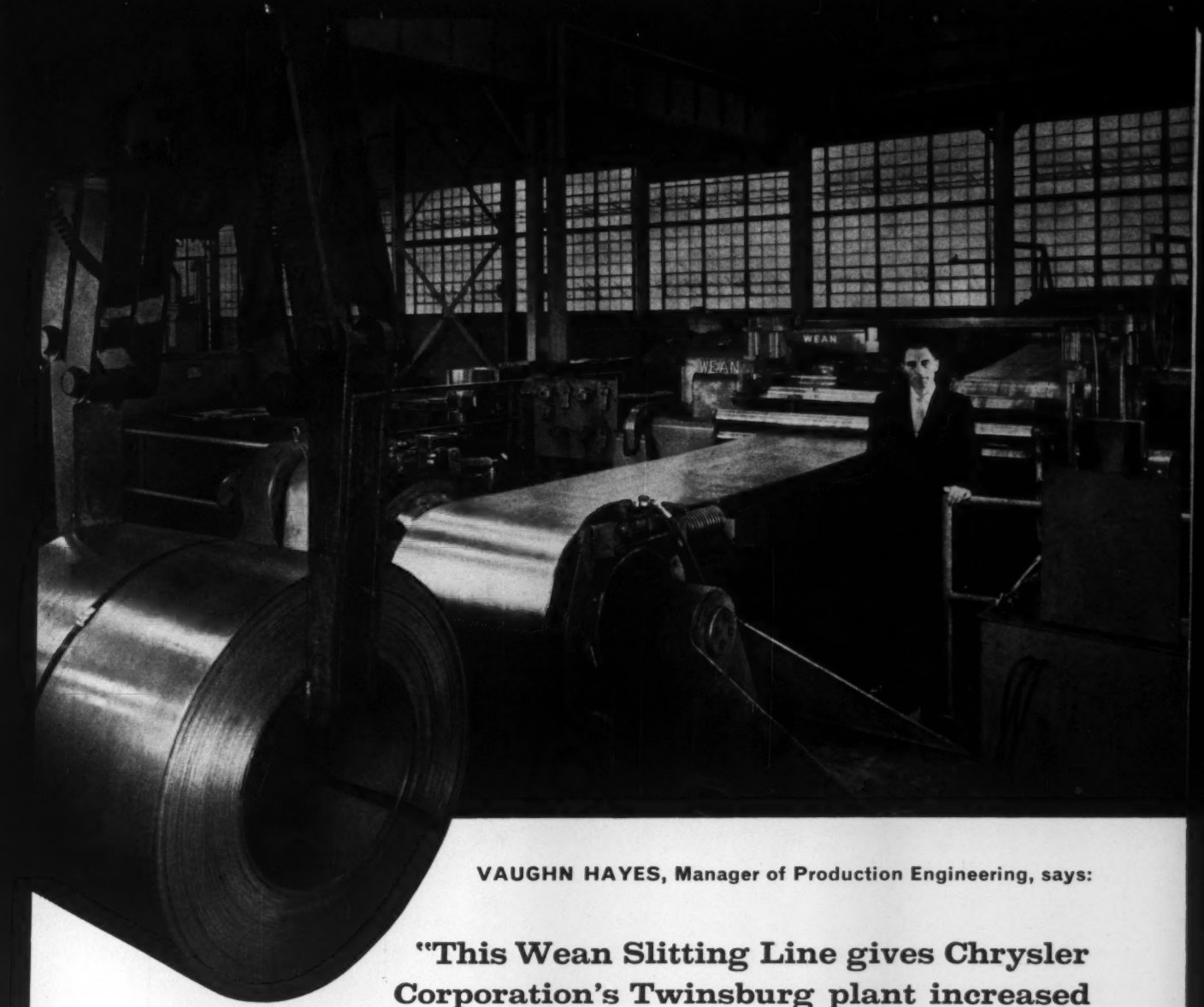
V-R Investment Castings are small, intricate pieces of precise shape and close tolerance for components such as those used in sewing machines, switches and other equipment requiring precision parts. New areas of design freedom are opened to the engineer. Metals with exceptional resistance to heat, wear and corrosion can be used and many intricate machining operations are completely eliminated.

CREATING THE METALS THAT SHAPE THE FUTURE

**VASCOLOY-RAMET**

868 MARKET STREET • WAUKEGAN, ILLINOIS

A-833




**VAUGHN HAYES, Manager of Production Engineering, says:**

## "This Wean Slitting Line gives Chrysler Corporation's Twinsburg plant increased flexibility in production planning

by allowing us to purchase standard size mill coils. We slit these coils to meet specific production requirements, eliminating special-width coil purchases. The line's 2,000 ton-per-month output helps us eliminate production delays and coil supply problems." Mr. Hayes' comments are typical of reasons why companies are using the *coil processing concept* to lower material costs, reduce inventory requirements and decrease scrap loss. If you process 500 tons or more per month of flat rolled metals, write for our new brochure entitled, "Coil Processing."

This brochure explains the concept and economics involved in *coil processing.* It also illustrates the types of Wean equipment that can help you cut inventory, production, and material costs when you process standard *mill* coils instead of sheets.

**WEAN EQUIPMENT CORPORATION**

22800 Lakeland Boulevard, Cleveland 17, Ohio Cable: WEANCOR

**WEAN**

*Represented by these Associate Companies:*

The McKAY MACHINE COMPANY (metalworking) • The WEAN ENGINEERING COMPANY, Inc. (primary steel)

# KEMP LEAD MELTING POTS *give you 5 exclusive advantages!*

Where speed plus top control counts, you can count on Kemp Immersion Heaters to give you accurate heat control in annealing, tempering, lead and tin melting and many other applications. Here's why:

**1 Only Kemp** Immersion Heaters are equipped with the exclusive Kemp Carburetor that pre-mixes air and gases. This means lower labor costs . . . more complete control . . . much faster starting.

**2 Only Kemp** puts the heat where it belongs—next to the material to be melted. Only Kemp uses recirculation heat tubes to transfer heat from the gases to the melt. Overruns and lags are virtually eliminated.

**3 Only Kemp** eliminates exposed flames, hazards to workers, equipment and plant. Burner is enclosed in heating tube.

**4 Only Kemp** assures you of no cracked pots at any time. Kemp pots are designed with a safety factor above the level of controlled heat.

**5 Only Kemp** gives you accurate temperature control at all times. Set the Kemp unit and forget about it. Kemp's exclusive heater design assures your melt will always, automatically, be uniform.

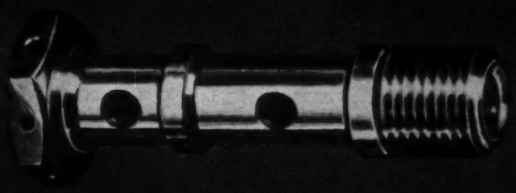
See the man from Kemp if you're in need of reliable immersion heater equipment. Write today for Bulletin IE-11 or call your local Kemp representative.

*It always pays to come to*

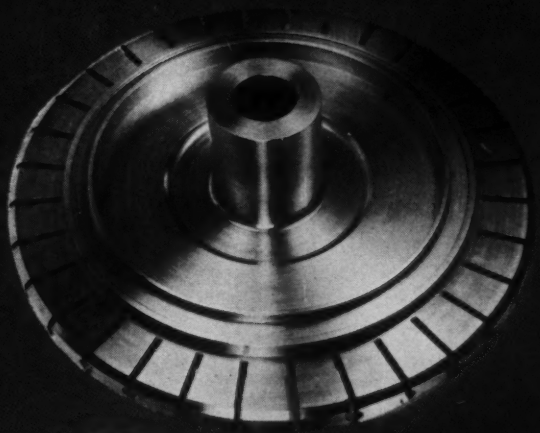
**KEMP**
OF BALTIMORE

**THE C. M. KEMP MANUFACTURING COMPANY**
**405 E. Oliver St., Baltimore 2, Md.**

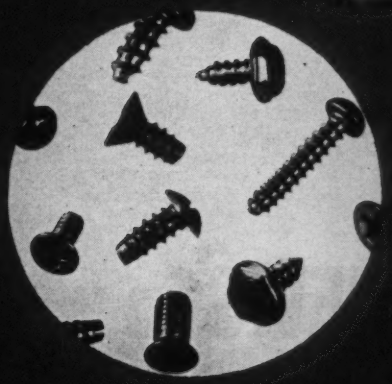
you can drill it...



you can machine it...



you can head it...



but you can never, no never, change its **consistent uniformity!**

**...your first order will convince you—Carpenter Specialty Stainless is easier to fabricate. Made by one of the leading producers of stainless steels for industry, Carpenter Specialty Stainless assures greater output, fewer rejects and increased profits.**

***Carpenter* steel**

you can do it ***consistently*** better with Carpenter Stainless Steels for specialists

Stainless Steel

The Carpenter Steel Company, Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

# BIGGEST NEWS in wire rope in years!

*You owe it to your company to learn about Macwhyte's new 7-FLEX.® But—be prepared to change your thinking about wire rope!*

You've never seen another wire rope like 7-FLEX — there is no other like it! It's an *all-purpose* wire rope, flexible as 8-strand — rugged as 6 x 19 — fatigue-resistant like a 6 x 37.

There is 16⅔% more wearing surface in 7-FLEX than there is in a 6-strand rope. There is less unit pressure between rope and sheaves, so less rope and sheave wear. There is more sheave contact, less rope-creep. Result: longer rope life, less downtime, lower operating costs!

7-FLEX can make important savings on many wire-rope applications. Ask any Macwhyte distributor. Free Bulletin 60100-R available upon request.

**Other Macwhyte products that serve you profitably**

**Slings** — Safe, easy-to-handle Macwhyte slings for every lifting need are available in round-braided, flat-braided, or Safe-Guard styles. Many standard designs. Also custom-made to your requirements. Send for Bulletins 5308-R and 5886.

**Corrosion-Resisting Wire Rope** — Many sizes and constructions in Stainless Steel, Monel Metal and plastic or nylon coated. Meet the requirements imposed by alkaline and acid conditions and marine atmospheres, temperatures, and humidity. Send for Bulletin 49-30.

**Wire Rope Assemblies** — Safe-Lock wire rope assemblies are precision made to your order in the size, length, and strength needed. Uniform high quality with fittings permanently swaged to the rope. Many standard designs. Send for Catalog 6101.

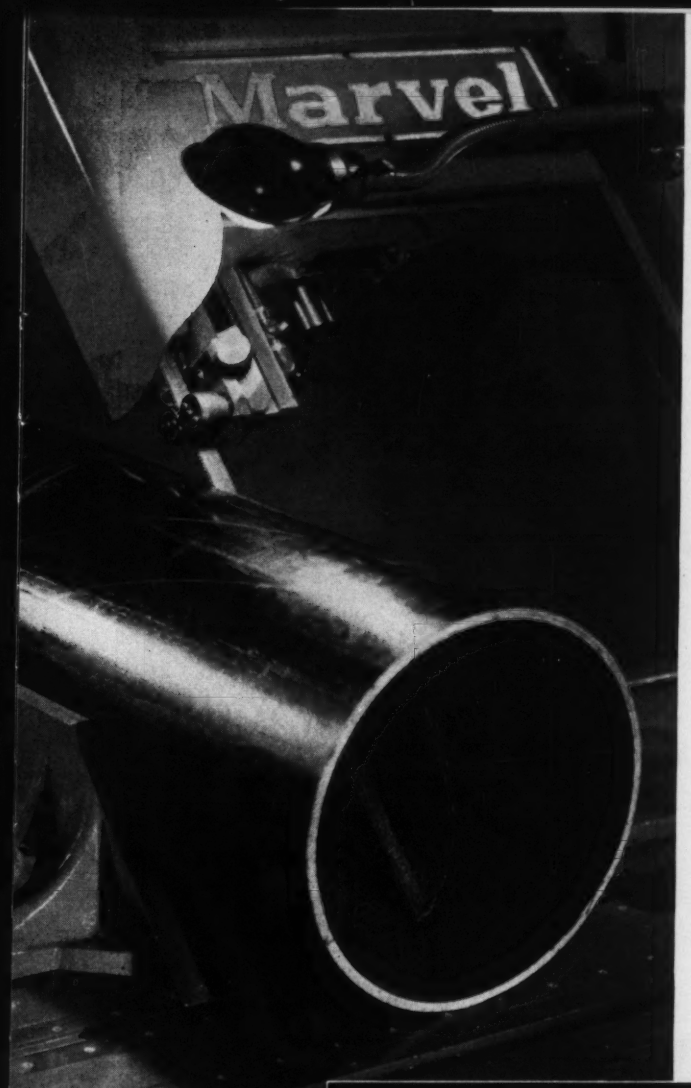
THE RIGHT MACWHYTE WIRE ROPE
INDUSTRIAL • AIRCRAFT • MINING • LOGGING • ELEVATOR • MARINE • CONSTRUCTION • DRILLING

## MACWHYTE Wire Rope COMPANY

2900 FOURTEENTH AVENUE, KENOSHA, WISCONSIN

*Wire Rope Manufacturing Specialists Since 1896*

246




*Problem:*

# One Straight Cut... *One Miter Cut*

*Solution:*

# One MARVEL No. 8 Band Saw

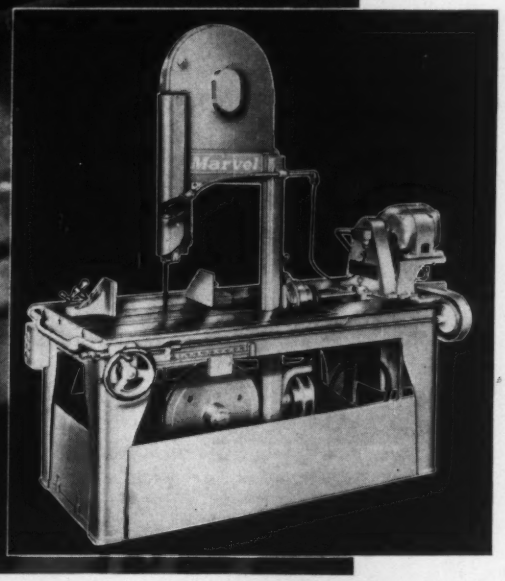
Recently, a MARVEL Field Engineer was called on to help solve a troublesome production sawing operation.

He found that a straight cut and a 45° miter cut were required on a 10″ diameter pipe prior to welding it into an assembly. Production was slow, cutting costs were climbing to alarming proportions, and too many pieces were being rejected because one or both cuts were not meeting accuracy standards.

The trouble was easy to find. A makeshift arrangement was being used to do the job. After the straight cut was made, the miter was laid out and the pipe swung out into the aisle so that the saw could make the angle cut. Excessive work handling slowed production, valuable floor space was taken up, and accuracy became increasingly difficult to maintain.

Recommending a MARVEL No. 8 Universal Band Saw solved the problem. When the MARVEL Field Engineer showed how the Saw's column and blade can be tilted up to 45° right or left of vertical and fed straight into and through the cut at the pre-determined angle *while the work remained stationary on the table*, the production superintendent recognized the answer to his problem. He also saw, how the built-in protractor would eliminate all layout.

Result: another MARVEL No. 8 Universal Band Saw went to work for a new user.




Cutting miters quickly and accurately is just one of a hundred jobs that can be done on the versatile No. 8 Universal Band Saw ... the most useful—and used—metal cutting saw on the market. Get complete information on this time and cost saving band saw today. Write for Catalog 875.

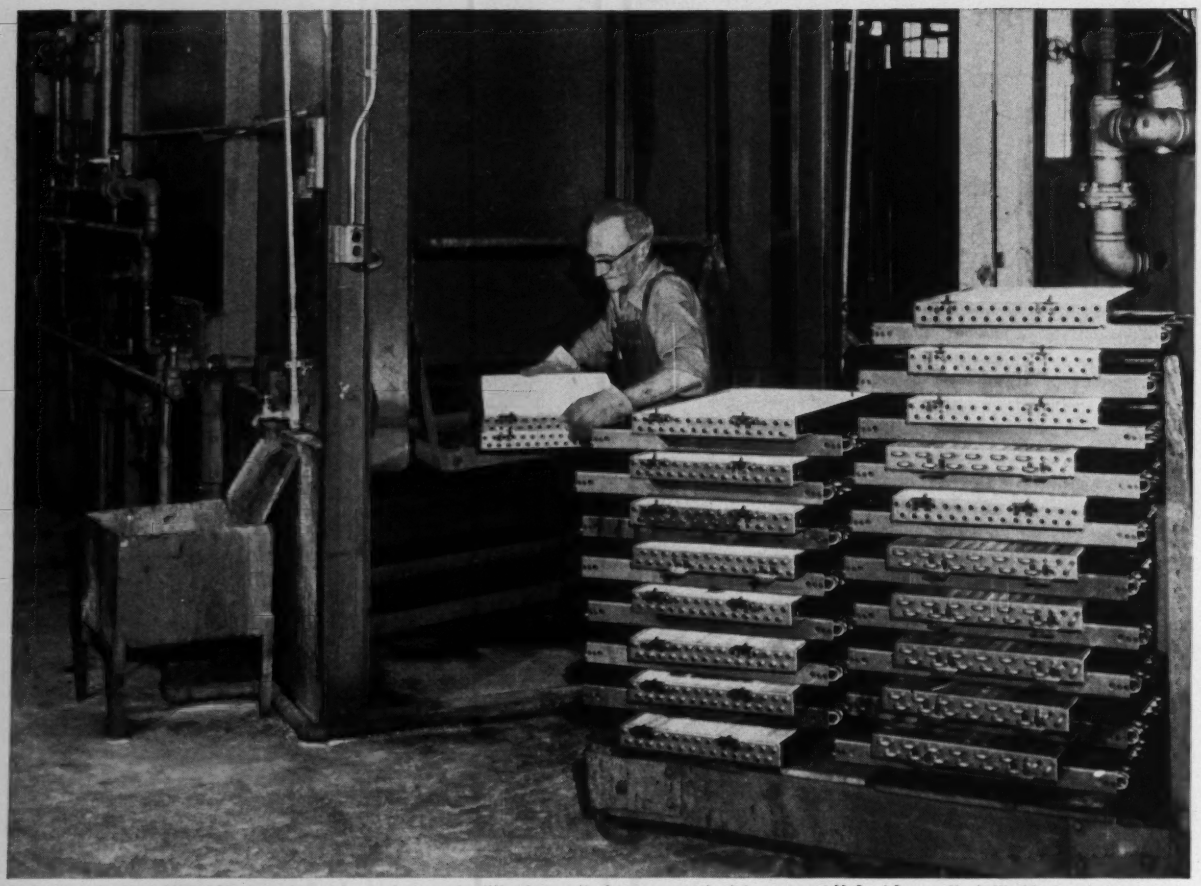
**Marvel No. 8 Universal**
**Metal Cutting Band Saw**
Capacity: 18″ x 18″

**MARVEL** *Metal Cutting* **SAWS**

BETTER MACHINES
BETTER BLADES

ARMSTRONG-BLUM MANUFACTURING CO. • 5700 Bloomingdale Avenue • Chicago 39, Illinois

S-1315



At the end of a Nialk TRICHLOR vapor degreasing cycle, operator lifts clean units from conveyorized degreaser at McCord Corporation's Washington, Indiana plant.

# HOW McCORD DEGREASES 57,000 PARTS BETWEEN CLEANOUTS

Oil, grease, and metal chips clinging to condenser and evaporator units create a complex cleaning problem for McCord Corporation.

Yet McCord degreases 57,000 units with Nialk® TRICHLORethylene before cleanout.

The bath doesn't go acid, even with metal chips in it. That's because the stabilizer has *psp*—permanent staying power. In more than five years of degreasing with Nialk TRICHLOR, McCord has never had to titrate or make any similar test.

"I don't see how you could find anything more appropriate to our type of operation," says Frank McDonald, plant foreman. "Nialk TRICHLOR is fast and efficient."

Ray B. Preston (left) of the P. B. & S. Chemical Company, the local Nialk TRICHLORethylene distributor, and McCord Corporation's plant manager, John C. Padden, discuss critical cleaning requirements.

Besides being pleased with the large volume of material degreased between cleanouts, Mr. McDonald has found "the help of the Hooker people in the operation of our degreaser of great benefit to us."

Whatever your metal, whatever your degreasing job, you can solve your cleaning problem with Nialk TRICHLOR. See your chemical distributor or drop us a line. Hooker experience is yours for the asking.

HOOKER CHEMICAL CORPORATION

306 UNION STREET, NIAGARA FALLS, NEW YORK

HOOKER CHEMICALS PLASTICS

*Sales offices:* Buffalo, Chicago, Detroit, Los Angeles, New York, Niagara Falls, Philadelphia, Tacoma, Worcester, Mass. *In Canada:* Hooker Chemicals Limited, North Vancouver, B.C.

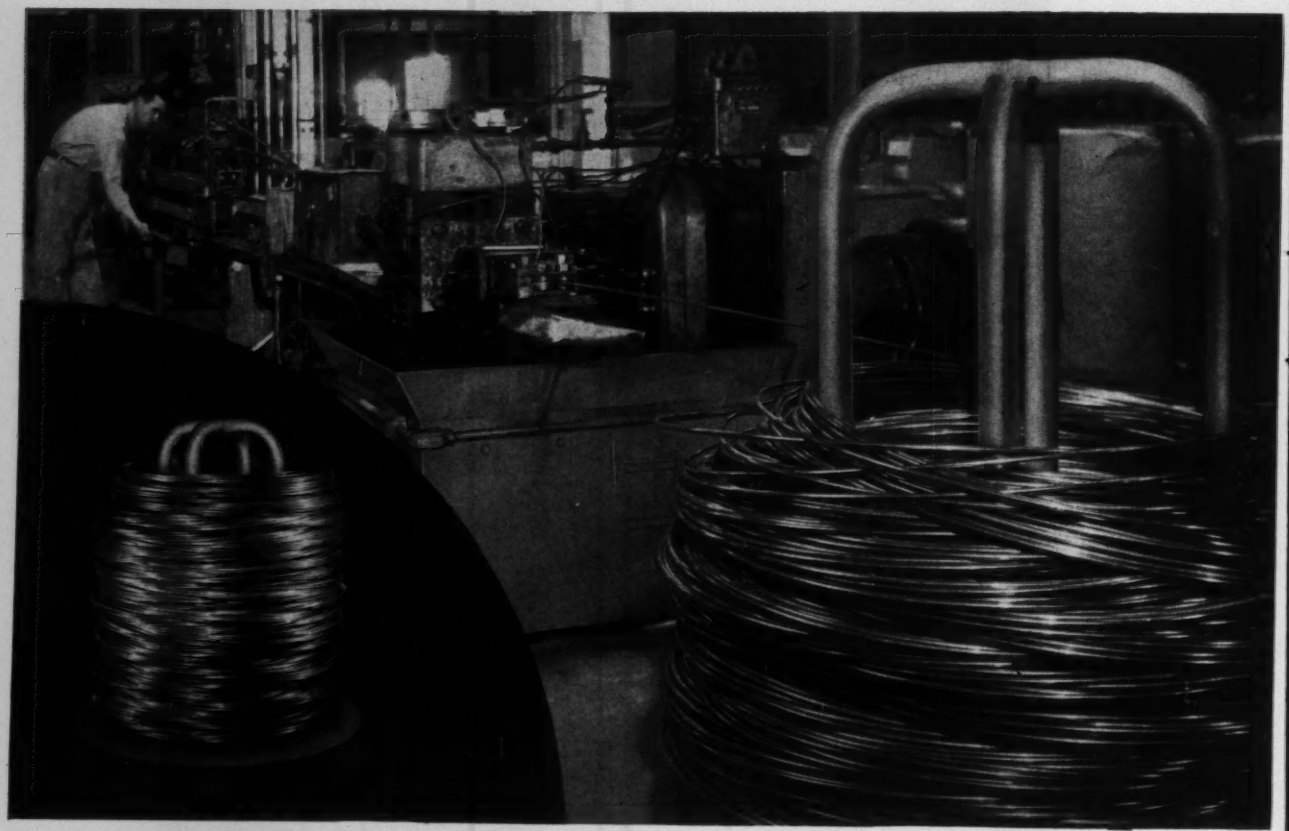
**discovered**—how to successfully harness **calcium** and **rare earth metals** in your high grade steel. From the AMMET research and development laboratories comes *LANCERLOY 802, the ingenious alloy discovery. LANCERLOY 802, the low-cost ladle addition, lowers oxygen content, minimizes "roping" in Stainless 430, increases ductility at all temperatures and increases rollability of stainless and fine grain steels. Discover how LANCERLOY 802 can save you dollars per ton. Write, wire or call

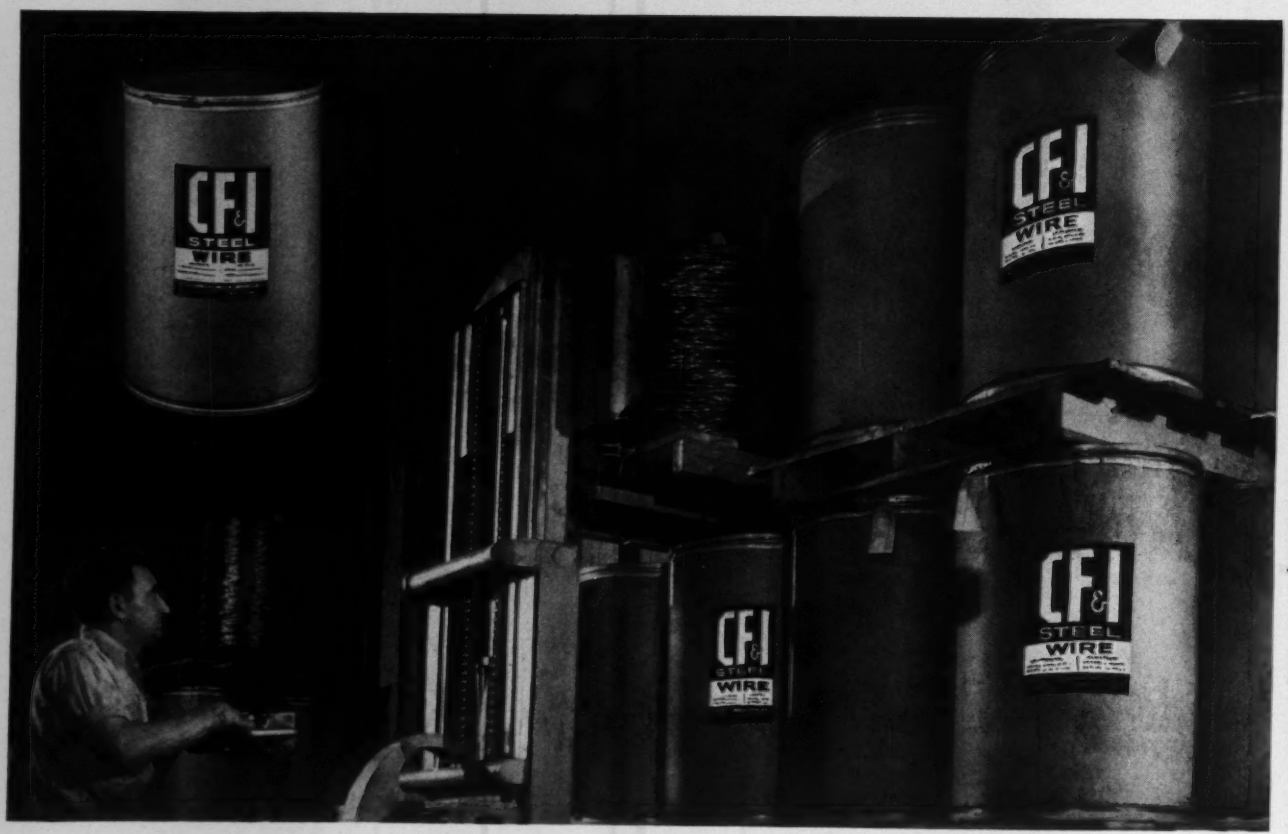
*All Patent Rights Reserved

AMMET

**AMERICAN METALLURGICAL PRODUCTS COMPANY, INC.**

9800 McKnight Road · Pittsburgh 37, Pa.
Telephone · WEllington 1-5040




CF&I
STEEL
WIRE
CF&I
STEEL
WIRE
CF&I
STEEL
WIRE
CF&I
STEEL
WIRE

# CF&I Spiders and Fibre Drums are packaged for your production

## RETURNABLE SPIDERS

Here's the experience of one typical user:

> "When we used small coils, we lost several feet every time we changed a coil. Now, using CF&I Spiders, we have cut our waste 80%. We've also improved the quality of our end product because we don't have to reset the machine. CF&I Spiders have reduced our handling and storage problems, too, because you've got a lot of wire in one easy-to-handle package."

CF&I-Wickwire Returnable Spiders hold 2000 to 3000 lbs. of wire in one continuous length . . . consist of a center core welded to a heavy base plate. Available in two standard types from our mills—with core diameters of 18″ and 22″.

OPERATING ADVANTAGES: Increased production, decreased labor, less scrap loss, ease of handling and improved quality of end products.

## FIBRE DRUMS

Here's what one satisfied user said about CF&I Fibre Drums:

> "They're an answer to the problem of unclean wire. The metal cover and locking band protect the wire from grime and other corrosive elements. The fact that they hold up to 600 lbs. of wire in one continuous length enables us to run our machines for a longer time than when we used small coils."

Fibre Drums hold 250 to 600 lbs. of wire in one continuous length . . . consist of a sturdy fibre container with center core, metal cover and locking band which protect the wire from atmosphere and dirt. The wire is directly withdrawn from the drum into your equipment. Available in full and half drums.

OPERATING ADVANTAGES:

- Cleaner wire, because the sealed drum protects the finish on the wire.
- Increased production, because of smooth pay-off and the fact that your machines have less downtime than with conventional coils.
- Less storage space required, because Fibre Drums can be stacked compactly on each other.
- Quick, easy handling . . . drums can be shipped strapped to a wooden pallet for convenient handling by a fork-lift truck.

ONLY CF&I OFFERS A TOTAL OF TEN DIFFERENT WIRE PACKAGES. You've just read how two of these packages have increased the production efficiency of leading manufacturers. One or more CF&I-Wickwire Wire packages can do the same for you. Our engineering staff will be happy to study your operation and recommend the type that best meets your requirements. For complete details, write your local CF&I sales office.

CF&I STEEL MADE IN U.S.A.

**THE COLORADO FUEL AND IRON CORPORATION**
**Denver • Oakland • New York**
**Sales Offices in Key Cities** 6137

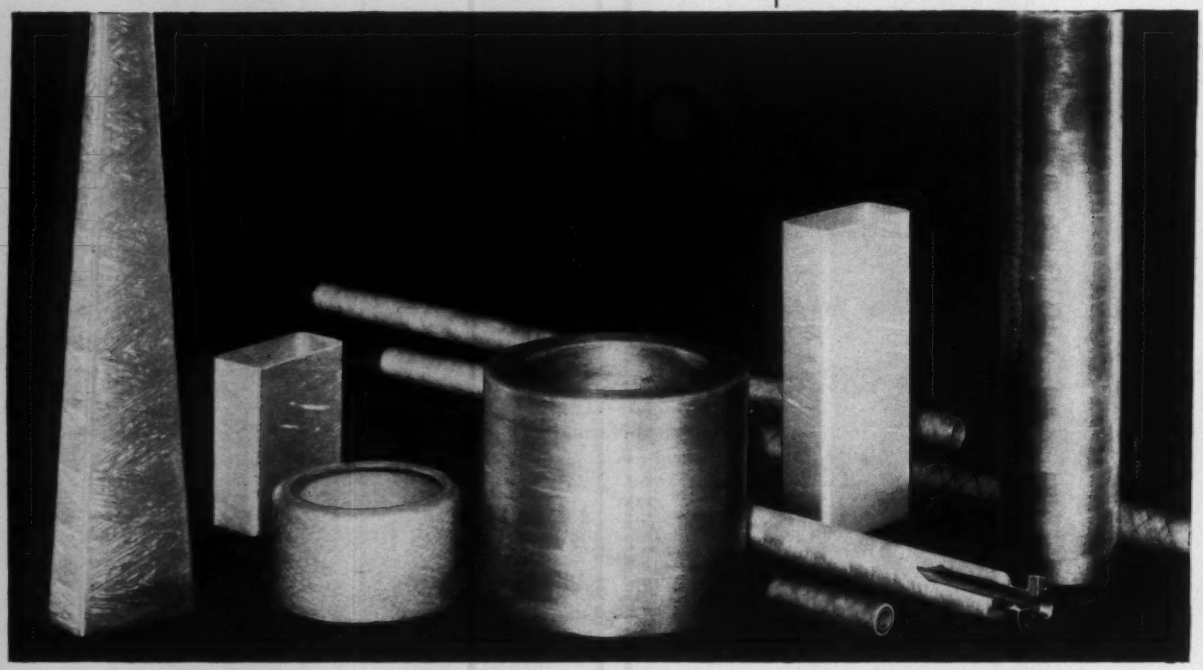
# SPAULDING GFW-60*

## *Glass filament wound epoxy tubing gives industry a new high burst strength material

Spaulding GFW-60 is designed to provide industry with a material of extremely high burst strengths for such applications as circuit breaker arc interruption chambers, high-voltage fuse tubes, switch gear and similar type components. It can be furnished with fibre liners, metal inserts, or with conductive layers.

Its ratio of burst strength to axial tensile strength can be varied to fit specific applications.

It is available in a variety of circular sizes and lengths, and with special shapes.



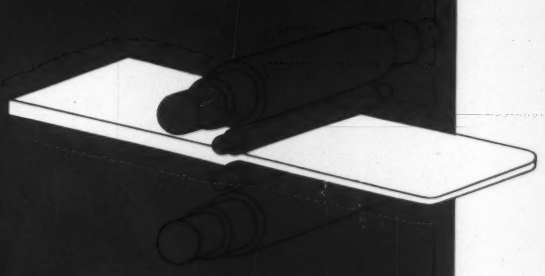
## PROFILE OF CHARACTERISTICS

| SPAULDING GFW-60 (1" x 1¼" size) | | |
|---|---|---|
| Water Absorption | % | .05 |
| Grease Burst | psi | 22,500 |
| Tensile Strength | psi | 8,250 |
| Compression Strength<br>Axially<br>Radially | psi<br>As Received<br>As Received | <br>19,300<br>920 |
| Dielectric Strength<br>V/M Perpendicular | Short Time | 401+ |

As with All of its Products for Industry, Spaulding Offers Complete Value Analysis and Fabricating Services for Your Application of GFW-60. Contact Spaulding for Details.

**SPAULDING FIBRE COMPANY, INC.**

323 WHEELER STREET, TONAWANDA, NEW YORK

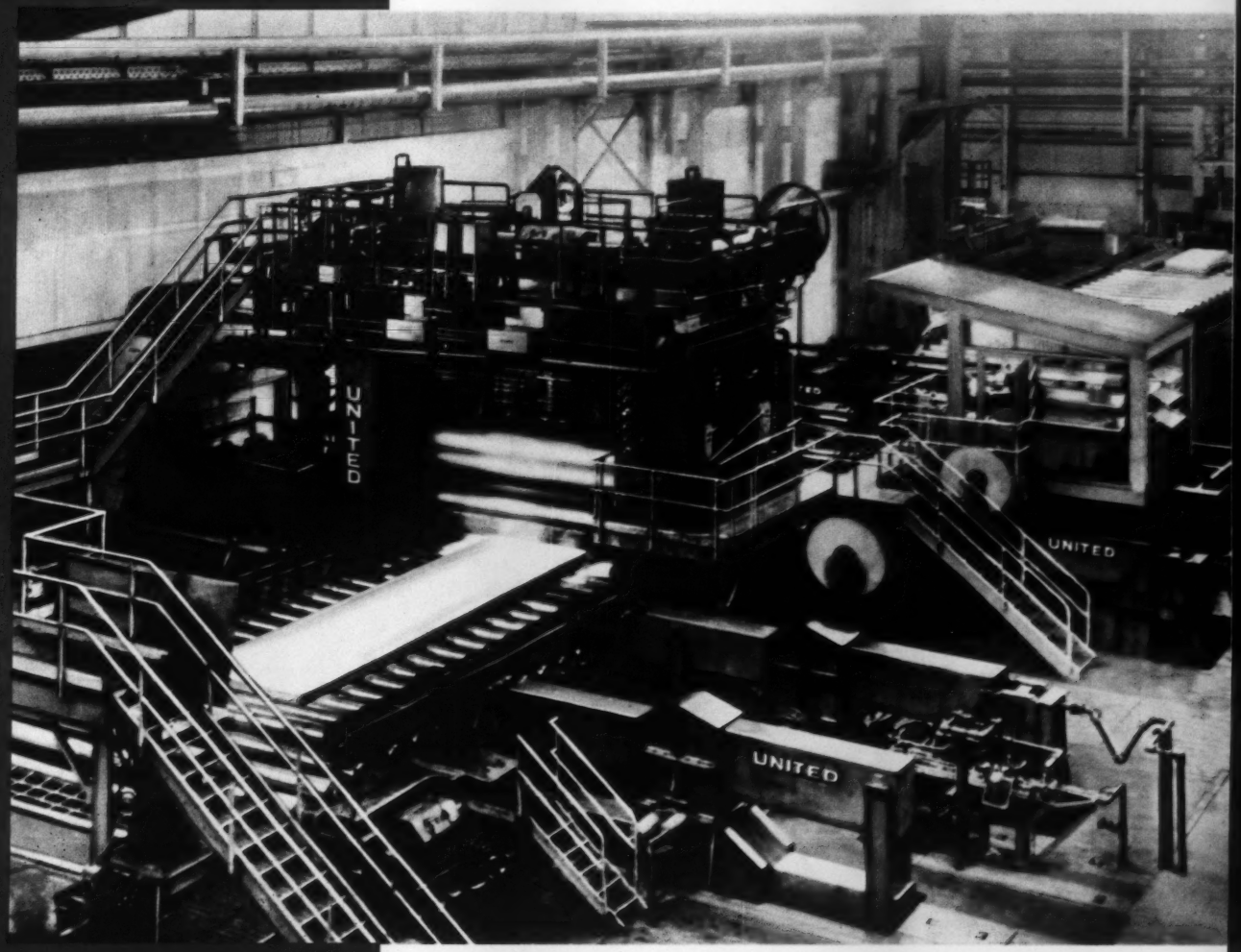


# UNITED®

## 170" 4-HIGH REVERSING

# HOT MILL

## FOR ROLLING ALUMINUM




This is the world's largest mill of this type for rolling aluminum and is in operation at the Reynolds Metals Company Alloys Plant, Sheffield, Alabama.

1901 1961 Leadership Sixty Years

**UNITED**

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH 22, PENNSYLVANIA

# *Quantity*
# PRODUCTION
## *of*
## GREY IRON CASTINGS

*

ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

*

ESTABLISHED 1866

**THE WHELAND COMPANY**

**FOUNDRY DIVISION**

MAIN OFFICE AND MANUFACTURING PLANTS

**CHATTANOOGA 2, TENNESSEE**

## Metalworking Newsfront 6

"HAIR LINE" CONTROL OF PURCHASED MATERIALS is noted by buyers in the May survey of the National Assn. of Purchasing Agents. They are reducing inventories with caution. More buyers are still lowering inventories than are raising them. And in forward buying, a "strong disinclination" is noted by buyers to speculate on shortages or price increases. (Also, see p. 154.)

STEEL INDUSTRY PRICE DIVERSITY is pointed up by W. G. Stewart, president, Universal Cyclops Steel Corp. He recently gave this rundown on his company's products: Stainless steel, $1100 per ton; tool steel, $2200; high temperature alloys, $5700; refractory metals, $20,000. Basic steels were pegged: Carbon steels, $140 a ton; electrical steels, $240 a ton.

ELECTRICAL HOUSEHOLD APPLIANCES scored sales gains in April over March in five out of seven item lines. On the "up" side were ranges, water heaters, dishwashers, food waste disposers and dehumidifiers. Only refrigerators and freezers went down. All gains were modest except for water heaters, up almost 10 pct. (Also, see p. 76.)

NEW CONSTRUCTION put in place in May amounted to $4.8 billion. This is 11 pct more than April business. A normal seasonal increase would be about 9 pct. And May business was 3 pct better than in May of last year.

MARKET RESEARCH for automobiles, appliances and utilities is getting a new lift from statistics from the 1960 census. Questions on ownership of these items are included on cross-indexed analyses of 22 million households now being made from government data.

ALUMINUM SUBWAY CARS have been ordered by the Toronto Transit Commission from Aluminium, Ltd. The new order for 36 cars follows past experience with both steel and aluminum by the commission. Existing aluminum cars are said to be 12,000 lb lighter than steel ones. In comparing bids the commission made an allowance of $3000 per car for cars that required no painting. And an allowance of $1.00 per lb was made for weight saved.

AUTO SALES STRENGTH is shown in Ford Motor Co. success in the first 22 selling days of May. Ford expects to have its best May sales since 1955, and its best sales month since June, 1959.

# Why Advertise At All?*

*A new approach to the job of increasing sales effectiveness... which challenges everyone who has a sales responsibility.*

If your job involves the creation of more sales, here at last is a tool you have needed for a long time. It can increase the impact of your total sales effort. It can put salesmen's time and talents to fuller, more productive use. It can pinpoint the most effective means of attacking a market. It can help to build sales volume to a degree considered "impossible" until now. *All at lower cost per dollar of sales!*

What is this new sales tool? A simple, analytical procedure which leads management—step-by-step—through its own sales objectives and its plans for achieving them. The result is a striking revelation. More often than not, it exposes a deficiency in the operation of a company. Management is made to realize, as never before, the true importance of "non-personal sales calls" and the vital part they play in increasing sales volume.

Beginning with the question, "Why advertise at all" the new approach goes on to firm up your company's or client's total market objective. It indicates how non-personal sales dollars can be stretched by applying sales effort with maximum efficiency. And to a major degree, it answers the basic question, "How should I allocate my sales budget for greatest effectiveness?" All in *actual figures*, pertinent to the *specific company*, which you insert in an easy-to-use workbook.

This new and unique approach to marketing goals is a *tested technique*. It is already proving to be one of the most useful tools ever developed for all who have a sales responsibility. As you might expect, the demand for this new tool is spreading rapidly. If your company or client sells anything to the metalworking market—companies that produce, fabricate, or use metal—your IRON AGE Regional Business Manager is ready to help you put our new concept to work. The tools are free. Call him now.

**Atlanta, Ga.** — JAckson 3-6791
**Chicago, Ill.** — RAndolph 6-2166
**Cleveland, Ohio** — SUperior 1-2860
**Columbus, Ohio** — CApital 1-3764
**Dallas, Tex.** — EMerson 8-4751
**Detroit, Mich.** — TRinity 1-3120
**Hartford, Conn.** — ADams 2-0486
**Los Angeles, Calif.** — SPring 2-1819
**New York, N.Y.** — OXford 7-3400
**Philadelphia, Pa.** — SHerwood 8-2000
**Pittsburgh, Pa.** — ATlantic 1-1830
**San Francisco, Calif.** — UNderhill 1-7107

* A management service of the IRON AGE — Copyright, 1961, The Chilton Company

**IRON AGE • a chilton publication • 56th & chestnut streets • philadelphia 39, pa.**

# Patent Hearings Flash Warnings; Industry's "Rights" at Stake

**Senate patent hearings indicate that reforms will come in the next session of Congress.**

**Companies may lose "rights" to products and processes developed under R & D contracts.**
**By R. W. Crosby**

■ The warning lights on government patent policy are flashing red for industry. Companies are in imminent danger of losing commercial rights to new products and techniques they develop under government contracts.

A vital question arises out of the patent controversy. Can companies afford to develop, but not acquire the right to sell commercially, such products as a new high temperature alloy; an aircraft engine; automobile power-steering; miniature electronic components; or automation equipment?

**New Policy Due**—The industrial items mentioned above are examples of commercial products developed by private companies through U. S. government research and development contracts. It is "rights" to patents on such products as these that Congress is considering giving to the government rather than industry.

Will Congress do it? In an exclusive IRON AGE interview, Sen. John L. McClellan (D., Ark.), influential chairman of the Senate Patents Subcommittee, let it be known that government patent policies are about to be reformed.

**Patent Hearings**—McClellan says Congress will establish a new patent policy "at a reasonably early date."

Right now there are two bills before Congress which would deprive industry of rights to inventions growing out of government-financed research and development. Other proposals to drastically change government patent policy also are being discussed.

These bills and proposals have just been given extensive hearings by Sen. McClellan's patent subcommittee.

**Senate Bills**—Here they are and what they would do:

S. 1084, introduced by Sen. McClellan, provides that the government shall take title to any inventions developed under government contracts, without exception.

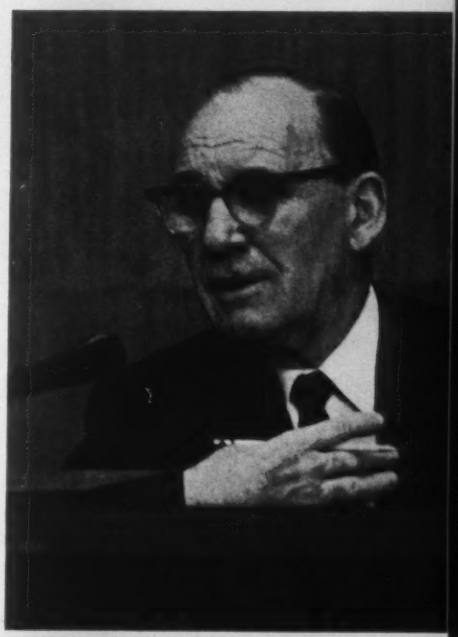
S. 1176, introduced by Sen. Russell B. Long (D., La.), would require the government to acquire title to the patents and calls for creation of a "Federal Inventions Administration," a new agency which would administer government patent rights "in the public interest."

**Other Proposals**—A major proposal being considered would establish an overall patent policy for all government agencies. (The National Aeronautics and Space Administration and the Atomic Energy Commission now acquire rights to all patents. In rather contradictory action, Congress is considering easing this rule in favor of industry.)

Also proposed is a rule to make the Department of Defense's license policy compatible with the title policy of a civilian agency when both are contracting for research in the same field with the same contractor.

**McClellan's Views**—The outlook for the bills, proposals, and patent policy in general was given by Sen. McClellan in his interview with The IRON AGE.

Asked if he, personally, sup-



**BILLS:** Sen. McClellan (top) and Sen. Long (bottom) have each sent patent reform bills to Congress.

**CAPITAL GOODS:** C. I. Derr (seated) and W. J. Healey, MAPI executives, made recommendations.

**SPEAKS FOR MANY:** R. R. Lent represented 130 small defense contractors at the patent hearings.

ported S. 1084 and/or S. 1176, Sen. McClellan replied:

"No, not necessarily. I introduced S. 1084, which is the same as S. 3550 that had been introduced in the last session of Congress by Senator Joseph O'Mahoney, my predecessor as chairman of the Senate Subcommittee on Patents, Trademarks, and Copyrights.

**Early Next Year**—"S. 1176 by Sen. Long is in some respects an improvement over S. 1084, but it has some features that will surely need to be eliminated or to be considerably modified."

Sen. McClellan sees "very little chance" that Congress will take action on either of the patent bills at its present session.

"It is probable, however," he predicts, "that at the second session of the 87th Congress, next year, the subcommittee will report out a bill that will receive Senate action."

More importantly, the Arkansas Senator adds: "I do think the Congress will at a reasonably early date enact a law that will establish an overall patent policy."

**Industry Opposes Tampering**—Industry is not opposed to an overall patent policy, only to some aspects that are being discussed. In fact, most businessmen would welcome patent policy stabilization. The opposition, expressed by industry at the present hearings, is to tampering with company patent rights with proposals incorporated in S. 1084 and S. 1176.

Sen. McClellan says: "There are differences of opinion as to whether these bills would have an adverse effect on industry. In my opinion, they would—unless some modifications are made."

**What's at Stake**—The question of the government controlling patent rights is commercial. The U. S. government already retains an irrevocable, royalty-free license to use patents developed with Federal funds. But what is at stake now is the commercial rights retained by private firms.

Industry spokesmen made their position on these rights clear at the Patent Subcommittee hearings.

Speaking for capital goods manufacturers, Charles I. Derr, vice president of the Machinery and Allied Product Institute, made three specific recommendations to Mr. McClellan's subcommittee:

**"We Recommend"**—"1. We recommend a government-wide license policy. It logically follows that we oppose the adoption of S. 1084, S. 1176, and the recommendation that the Dept. of Defense patent policy be made to conform with that of civilian agencies where both are investigating a single field of knowledge with the same contractor.

"2. Any legislation which may be considered necessary should require as a general rule that patent rights be granted to R & D contractors with an irrevocable, royalty-free, nonexclusive license to the government.

"3. In no event should legislation be adopted until a further and more comprehensive study has been made of the effects at procurement patent policy both on the accomplishment of governmental objectives in research and development programs and on our national economy."

**Small Contractors**—Speaking for a group of 130 small defense contractors, Robert R. Lent, representing the Strategic Industries Assn., told the subcommittee:

"The concept of a Federal Inventions Administration is founded on a fallacy and innocently negates its own purpose. Mr. Long's bill would establish an entirely new government agency to administer things that simply do not and cannot exist.

**Contrary to Intent**—"The concept of the government-owned patent is merely a play on words and attempts to somehow integrate "public" and "private" into a single word. For more than a century a patent has been defined as the right of its owner to exclude others from its use, and this the proposed Federal Inventions Administration will not do.

"Thus, simple definition tells us that the effect of S. 1176 is to simply annihilate the concept and definition of the patent in the United States, where public funds were used in its creation."

**Senator's Rebuttal**—Sen. Long's general answer to industry is:

"A private company, when it

spends large sums on developing manufacturing know-how, cannot be expected to yield such information to the public without charge.

"But there is no reason why publicly financed know-how and inventions should not be made available to the public either free or on the most liberal terms."

**What's Wrong** — The Louisiana senator lists several things he believes are wrong with the present patent system. He says:

1. The government doesn't get what it pays for.

2. The patent system contributes toward increased concentration of economic power.

3. The present system deprives small business of free access to the use of new developments.

**Points Questioned**—Industry spokesmen question the validity of Sen. Long's points. They argue that the government gets just what it pays for, saying it pays for the performance of research and development work.

Charles Derr, of MAPI, sums up industry's argument against the charges that the present patent policy helps create monopolies and are antismall business.

**"Fruitful Incubator"** — "Despite the fact that a large proportion of government research and development has gone to larger companies," he says, "we suggest that government-sponsored research and development has also been a most fruitful incubator of small businesses devoted largely to such work."

**The Vital Question**—Can industry afford to develop new products without getting the right to sell them commercially?

Opponents of changing the patent rights call the patent incentive one of the most productive parts of R & D work. Proponents of patent reform argue that contract expenditures and the national interest are incentive enough.

If Sen. McClellan's predictions are right, Congress will settle the argument in its next session.

# New Uses, Price Spur Plastics Push

■ Plastics will be bigger than ever in the next decade or two.

This was the theme and promise at last week's National Plastics Exposition and Conference in New York. Over 40,000 visitors saw exhibits of 260 companies.

Keynote conference speaker was Dr. Hugh L. Dryden, deputy director, National Aeronautics and Space Administration. He sparked the optimistic mood by predicting, "The future for plastics is exceedingly bright. Output should approach 25 billion lb by 1975, compared with 6.5 billion in 1960."

**Wide Growth** — Plastics will boom in varied markets.

Automobiles will use 45 lb of plastics by 1965, compared with 25 lb per car today. This is forecast by T. H. Risk and J. R. Forrester, Jr., of Ford Motor Co.'s engineering and research staff.

Packagers will use 19 pct more plastics annually, compounded, during the next five years. Donald R. Mahaney, Monsanto Chemical Co., predicts an $800 million market here by 1965.

About $4.5 billion will be spent annually on plastics for home and commercial construction, a whopping jump from $450 million today. This is cited by Harry B. Warner, president, B. F. Goodrich Chemical Co.

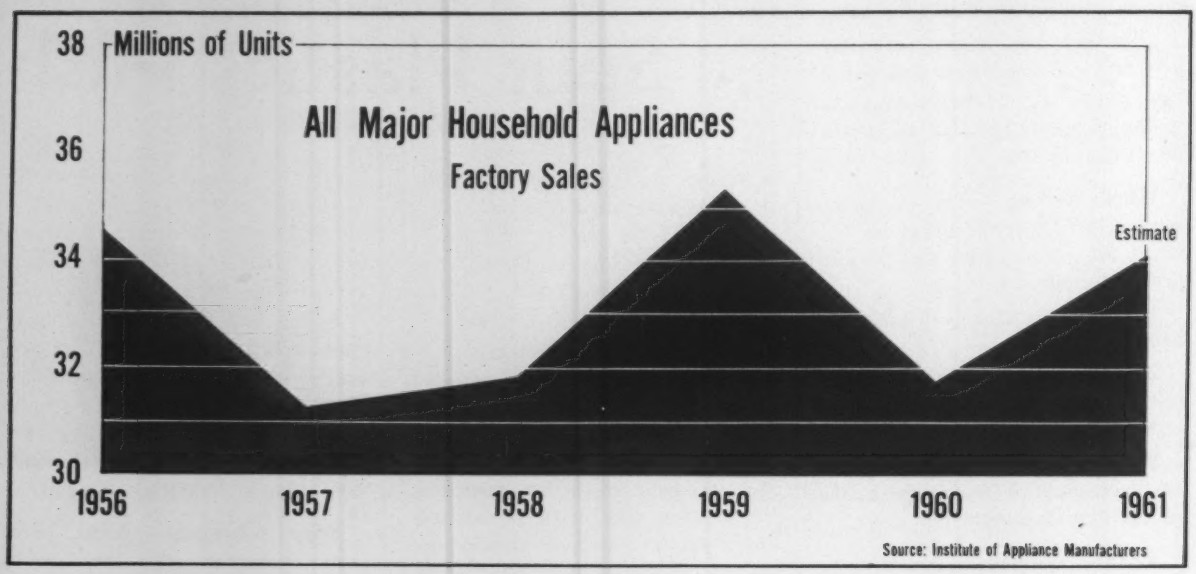
**Price Advantage** — Most company spokesmen rate the current price picture of prime importance.

E. E. Winne, W. R. Grace & Co., says there will be a continuing growth of areas where plastics have an economic advantage, as metal prices climb and plastic resin prices remain stable or drop.

Plastics makers are ready to compete with any material to realize their promising future. And metals seem to be the prime target.

**"MILLED" MODEL:** Richard J. Slater, project manager, G. T. Schjeldahl Co., studies chemically "milled" model satellite. Skin is aluminum and Mylar laminate, with circular windows "milled" out of the aluminum.

# Will Major Appliance Sales Top 1960 Level?




# Appliance Makers Sight Upturn

**After a bad first quarter, appliance makers feel their recession is ending.**

**Sixteen of 18 leaders forecast a second half upturn above the same period in 1960. Some see 1961 even topping 1960 sales.**
**By T. M. Rohan**

■ Appliancemakers' hopes for an upturn hang on the second half of 1961.

After a rough first quarter, most companies now feel the end of their recession is in sight. Sixteen of 18 executives polled at the annual convention of the Institute of Appliance Manufacturers in Cincinnati hold this view.

There is less griping now. Only two executives forecast same or lower sales in the coming months. They believe durable goods will trail the general economic recovery.

**Bad Beginning**—The first quarter this year was indeed rough.

Compared with the first quarter, 1960, sales of electric ranges were off 8 pct; gas ranges, off 17 pct on factory unit sales; refrigerators, off 17 pct; washers and dryers, off 9 and 13 pct, respectively; and washer-dryer combinations, off a whopping 52 pct.

First quarter earnings were far below expectations. In some companies, they were only half that of a year ago.

**Better Outlook**—The prospects now are much brighter.

Sol Goldin, Institute president and retail marketing manager, Whirlpool Corp., says, "We expect a definite second-half upturn in sales of major home appliances.

"Durable goods normally lead other economic indicators by four to five months on a downturn, and generally turn upward at about the same time. While retail home appliance sales have softened in the past 18 months, the most recent decline has been primarily an inventory recession.

"Inventory liquidation, continued through April of this year, has now reached the point where increases in retail activity, which normally accompany general economic recovery, should produce an almost immediate upturn in appliance manufacturers shipments."

**Too Early**—Claire G. Ely, marketing vice president, Maytag Co., is less optimistic. He expects a second half improvement. But, he says, "It is too early to predict whether the year will exceed 1960, although we believe it is possible."

Judson Sayre, chairman, Norge Corp., is more positive. He says, "The appliance industry will definitely make a strong upsurge and finish ahead of last year."

H. L. Travis, sales vice president, Kelvinator International Corp., expects a whopping 10 pct increase in the second half. He also says, "there is little sign of a significant deterioration of prices."

# Bigger Tax on Overseas Profits?

## Industry Opposes President's New Plan

**Tighter tax treatment on U. S. overseas profits will hurt the economy, businessmen claim.**

**American companies go abroad to sell, not to escape taxation, tax committees told.**
**By R. W. Crosby**

■ The Kennedy Administration was found lacking in knowledge of international business by industry men opposing his plan to tighten tax treatment of business earnings abroad.

"One cannot escape the conclusion," says Frank X. White, president of American Machine and Foundry International, "that these proposals are based on misunderstandings stemming from a lack of knowledge of operating conditions in international business.

"Too much emphasis has been placed on the role of tax considerations in international business decisions. Responsible companies go abroad for solid business reasons—not to escape taxation."

**Battle Shaping Up**—After a week of such testimony before the House Ways and Means Committee, it is evident that President Kennedy has a fight on his hands in getting his foreign income tax proposals through Congress.

The President wants to eliminate tax deferral on income earned in "developing" foreign countries and eliminate "tax haven" deferral privileges in all countries.

Under the President's plan, U. S. subsidiaries abroad would pay taxes as the money was earned. The deferral would continue to apply to subsidiaries operating in less developed countries.

**"Tax Havens?"** — The so-called "tax havens" are countries with little or no corporate taxes.

The Ways and Means Committee, holding hearings on the President's entire tax message, heard businessman after businessman claim the "lack of knowledge" about international business would weaken the U. S. economic position abroad.

Mr. White, backed up by AMF International Vice President Alexander Thomas, testified further: "If these proposals with respect to taxation of American overseas subsidiaries were to be adopted, and if the rate of American investment abroad slows down as a result, as we believe it will, there is every expectation that the vacuum created will be filled by more activity on the part of British, German, Italian, and Japanese capital."

**How Much Incentive?**—He was supported by many witnesses.

John Curran, speaking for the National Machine Tool Builders, told the committee:

"It is error to state that this deferral is the prime motive behind investment in foreign countries. It is chaos compounded to state that taxation of enterprise abroad shall be bottomed on the year-to-year definition by a government official of what constitutes an 'economically advanced' or 'developing economy.' "

**INCOME TALKS:** F. X. White, president (left), and S. A. Thomas, vice president, American Machine and Foundry International, discuss Mr. White's testimony on foreign income before Ways and Means Committee.

# Farm Tool Outlook Strengthens

## Manufacturers Look for Gains This Year

**Farm equipment makers say earlier forecasts were conservative. They now look for a five pct gain over 1960 sales.**

**Reason: Farm gross income has been revised upwards.**
**By K. W. Bennett**

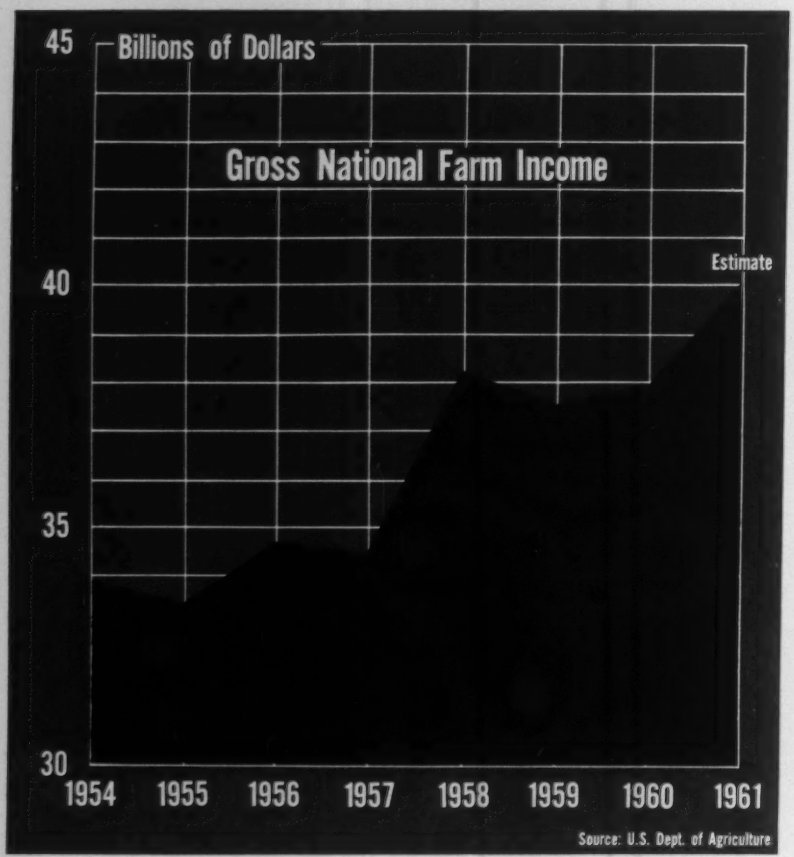
■ How good is the farm equipment outlook?

Farm gross income has now been revised upwards. Earlier forecasts called for it to equal 1960's $38 billion. Now predictions are that the gross income will reach $40 billion in 1961.

And the farm equipment industry predicts 1961 sales of tractors and equipment totaling $1.9 billion. That would top last year's level of $1.8 billion by five pct. And some producers call this a conservative estimate.

To metalworkers, this means a major market is shaping up for the second half of the year. There are just over 1000 manufacturers of farm equipment. Whereas farm equipment sales in the late 1930's were peaking at $500 million annually, sales in the late 1950's exceeded $1.5 billion each year. They have soared as high as $2.4 billion.

## Farm Income Continues to Rise




**Important Gain**—W. L. Voegeli, general sales manager, farm equipment division, Allis-Chalmers Manufacturing Co., told The IRON AGE: "The gain in farm income is important. It means a considerably greater portion of income, percentage-wise, is available for equipment purchases than was the case one year ago.

"We pegged our forecasts for a five to ten pct gain in 1961. It's now increasingly likely that 1962 could see farm equipment sales move to a record post-1954 level. Our field inventories are still lower than they were a year ago. So manufacturing will be aimed at rebuilding inventories in addition to meeting rising sales levels. All in all, 1962 looks like a banner year."

F. M. Johnson, assistant director for agricultural equipment, BDSA, Dept. of Commerce, reports "The 1961 prospects for increased sales in farm equipment are better today than they were in December. I wouldn't put a finger on it, but the gains over 1960 levels will be substantial.

"It's worth remembering that, though 1960 manufacturing levels slipped, retail sales held high enough to permit reductions of finished goods inventories. Consequently, production and retail sales will more nearly equal each other in 1961."

**Agreement**—Among farm equipment makers, no matter what their forecasts for 1961 and 1962, these plus signs are agreed on:

Inventories of finished goods are balanced. Tractor inventories were cut from 187,000 units in spring, 1960 to 128,000 units in January, 1961. And combine inventories were slashed at least 20 pct.

Also, high purchasing periods for raw materials and components are the first and last quarters of the year. Since the industry was cutting

finished goods inventories through the last November-March period, raw material and tooling purchases were down. In the second half of this year, industry purchases will exceed both the second half of 1960 and the first half of 1961. In some cases, farm equipment makers will up their own buying by as much as 25 pct.

**Available Funds**—Other factors: Most farm equipment is sold in the first half of the year. This means money will be in the company treasury for the second half. And, high farm gross income usually leads a strong buying period by six months. This means that record farm income in 1961 will throw record farm cash into the first period of 1962.

With these optimistic signs, why are some implement makers cautious?

Ford Motor Co.'s Tractor and Implement Div. warns that farmers buy equipment from profits not gross income. And, they say, severe weather has hurt farm profits this year. International - Harvester Co. agrees with this thinking.

E. W. Ukkelberg, regional sales manager, Deere & Co., says: "I don't think 1962 will be a record year. But I believe that it will be at least as good as this year, maybe a little less. Our record year was 1959. And we don't expect 1961 to quite equal that level."

**Acreage Retirement** — Another worry of farm equipment makers is the proposed acreage retirement program for farmers. Mr. Ukkelberg notes, "We're wondering what effect the new feed program, in reducing acres farmed, will have on farm equipment purchases. The farmer's income will be higher, but will he need more equipment?"

C. L. Dickinson, research director, Farm Equipment Institute, says: "It seems to me that it's still doubtful that there will be any real effect on farm equipment sales as a result of land being idle under the acreage retirement program. Farmers will farm less land. But don't forget, they'll have substantial increases in their dollar income."

# Nuclear Men View Safety Problems

**As nuclear reactors move closer to commercial use, the industry is taking a hard look at the problem of safety.**

**Currently, safety measures add up to 15 pct to the total cost of a reactor.**

**By G. J. McManus**

■ Nuclear men have paused for a hard look at safety.

With reactors moving out of their private world and into commercial use, two questions are getting open attention:

1. How safe should peaceful atoms be?

2. How should the matter of safety be approached?

Riding with the answers are the future economics and progress of nuclear power. M. C. Leverett, president, American Nuclear Society, says 10 to 15 pct of a reactor's cost is currently due to safety measures.

In forcing construction of reactors away from the cities, says Mr. Leverett, an executive of Atomic Nuclear Propulsion Dept., General Electric Co., $1 million is added to capital and operating costs for every 10 miles of extra transmission.

**Rare Rundown**—His comments came at the recent Pittsburgh meeting of ANS. The sessions were marked by one of the rare public rundowns of major radiation accidents. While some nuclear men insist there is no new emphasis on reactor hazards, a number of developments point to growing public pressure. Among these:

First, United Auto Workers has brought suit in connection with the Enrico Fermi power plant in Detroit. The case, now before the U. S. Supreme Court, has broadened from a safety action to a test of the powers of the Atomic Energy Commission.

Second, three men were killed in January when an SL-1 reactor got out of hand in Idaho. These were the first deaths in this country due to actual nuclear activity. As such, they have been widely publicized.

Finally, AEC has come out with a suggested set of guides for locating power reactors. In the examples listed by the agency, a plant with a thermal megawatt rating of 1500 would have to be at least 17 miles from the nearest population center.

**Want Safety**—These and other events have stirred fears in nuclear circles. The reactor people aren't pushing for any wholesale relaxing of safety rules. Mr. Leverett feels the proposed guides are basically "sound and workable."

But there is concern that the nuclear industry could be saddled with too rigid a safety code. There is the feeling that safety thinking has been geared too much to the most extreme and remote kind of disaster. Mr. Leverett suggests the probability of an accident might be considered rather than just the capacity for damage in a given reactor. However, he admits there is ground for a conservative approach.

"There is really a lot we don't know," he says.

**Better Measures**—In this connection, he feels there is a need to develop better information on safety measures. He points out that AEC's reactor program devotes only $4 million to safety work out of a total budget of $400 million.

Some of the doubts of the nuclear industry are answered by L. J. Haworth, a recently-appointed AEC commissioner.

He feels current safety programs must take into consideration the great potential for damage and the uncertainty of knowledge.

**PRODUCTION:** This plate mill at Phoenix-Rheinrohr's plant in Mullheim is the largest in Europe.

## Report From West Germany

# Steel Expansion Rate Slows Down

**West German steel producers are cutting back the rate of new expansion.**

**Earlier drives are closing the supply-demand gap. But steel output is still high.**

**By E. C. Beaudet**

■ Some of the steam is now being taken out of West Germany's steel expansion drive.

This year steel producers are investing less in new melting and rolling facilities than they have for some time back. The reasons: A catching up with total market demand; a shortage of new capital; and a need to digest the big expansion gains of the past eight years.

**Expansion Slows**—Steel capacity in West Germany has just about doubled since 1952. During this period the yearly investment in new production facilities averaged $250 million. However, the peak was hit in the past two years.

Despite the expansion slowdown, West Germany's steel output this year is still expected to top that of 1960. However, the increase in the rate of demand is falling off.

Last year, West Germany's steel mills turned out 37 million net tons of ingots and 25 million net tons of rolled steel products.

**Market Growth**—Now, with the operating rate in large steel plants running anywhere from 85 to 95 pct of capacity, West Germany steel industry executives see at most a 2 pct gain in production over 1960.

For the next five years industry officials predict an average increase in domestic steel demand of four to five pct. However, they are less confident of their export markets.

Exports of steel products now run about 15 to 20 pct of total steel production. Another 20 pct is exported in the form of equipment and machinery.

**Export Competition**—This overall view of the West German steel market is supported by the experience of individual steel producers.

A spokesman for Mannesman A. G., one of the country's largest, reports that first-quarter 1961 sales ran higher than 1960. But the percent of increase was no where as great as it was two years ago.

The company, which exported 75 pct of its oil country goods last year, reports a substantial slowdown in demand for these items. On small-diameter welded tubing, delivery times are running six to eight weeks.

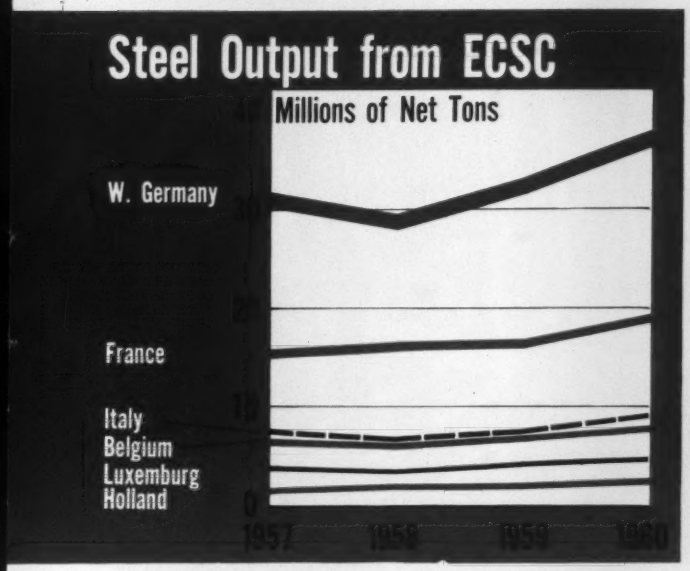
To meet competition for exports markets, the company has adjusted prices on gas, steam and water tubing to offset the effects of the D-Mark revaluation.

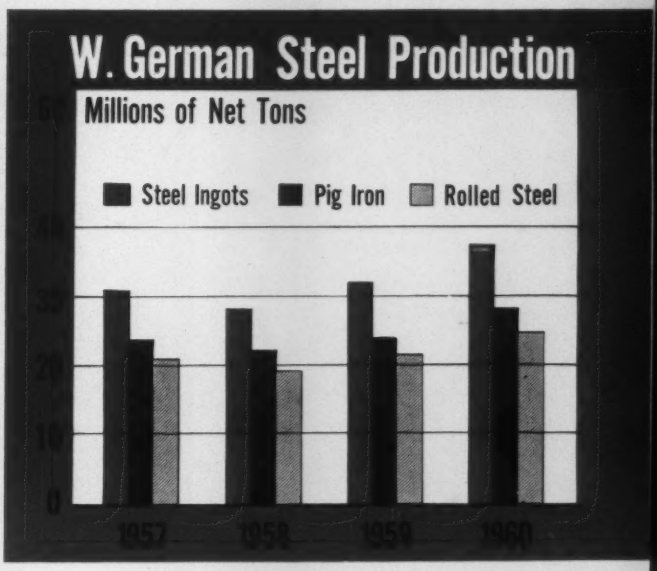
**Wage Pressure**—One of the company's major concerns, according to this official, is the mounting cost of labor.

**NEXT WEEK**

**Impact on U. S.**

The problems and opportunities facing U. S. industry by W. Germany's booming economy will appear next week.




In the face of another wage increase this year he says, "We have just about reached the limit on wage increases. In the future we will only be able to sell on the quality of the production we produce. There is no way to stop the tendency of labor unions to demand more money. In ten years inflation will be a big problem."

**Pipe for Russia**—Right now Mannesman's biggest demand is coming from the booming West German construction industry. Structural products and reinforcing bars are selling at a brisk pace and the company is increasing its capacity to stay abreast of this particular market.

Phoenix-Rheinrohr A.G., another large producer, reports an order pickup in March and April after a slow January and February. Order books were strengthened by new orders from pipeline builders in the Common Market countries and the Soviet Union. The Russians are ordering 34-in. diameter pipe but, as is usual, will not disclose its eventual destination. The company reports a good market in the U. S. for small-diameter tubing.

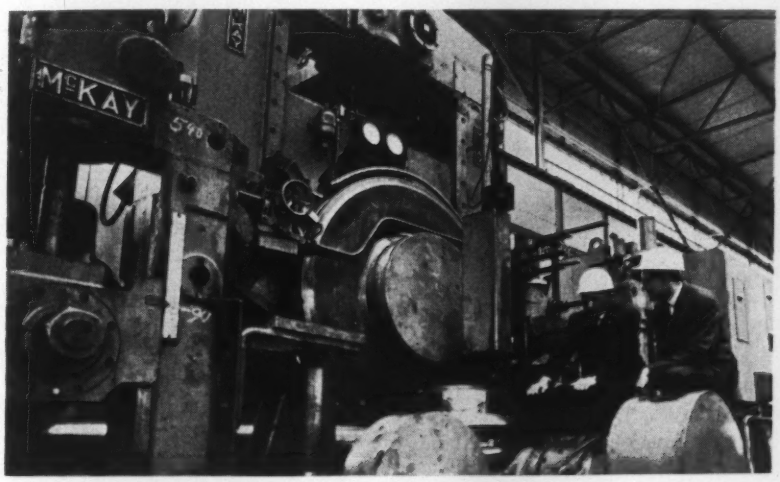
**More Oxygen**—Still expanding, Phoenix is putting in two new oxygen converters of up to 80 tons capacity which it expects to have ready by 1963.

While the overall demand for West German steel is expected to run higher than 1960, there are some factors which could set back the market before year end.

**Negative Factors**—For one thing, West German steel users have been steadily replenishing inventories since 1958. Steel deliveries for the most part are meeting demand. A turnabout in inventory policies could change the market picture quickly.

Exports, too, can become a problem. With world steel capacity rising, the U. S. market not sufficiently out of its slump to buy larger quantities in West Germany, and a low level of buying from less industrialized nations, export prices of West German steel dropped last year.

Finally, the effect of the D-Mark revaluation has yet to be felt. But there is a possibility that it could make West German steel less attractive in last-half 1961.



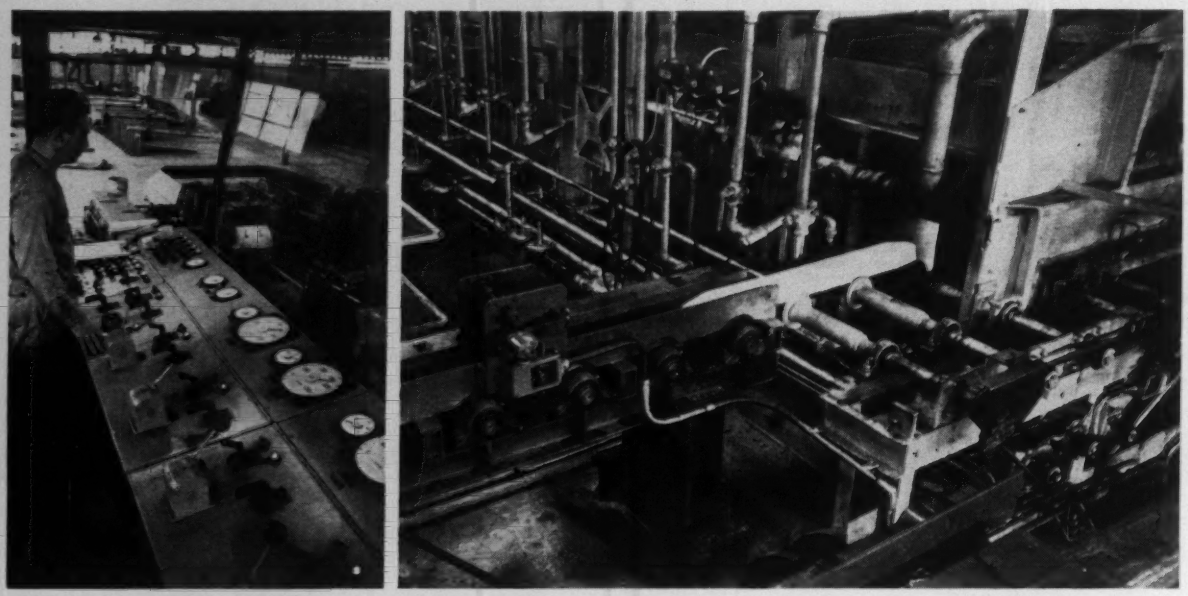

**EXPANSION:** New tube mill built by McKay Machine Co. of Youngstown, O., recently installed at Phoenix turns out 6 to 18-in. diam tubing.

---

**Reprints** of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 184**

## Copper Rod Rolled in Completely "Robot" Operation



**AUTOMATED MILL:** Continental Copper & Steel Industries, Inc., has a new fully automated $3 million copper rod rolling mill at Linden, N. J. It can be operated with three men, compared with 20 to 30 in conventional mills. One engineer (left) controls entire operations in "pulpit" which overlooks every stage. A 265-lb, 52-in. long bar of pure electrolytic copper (right) is automatically ejected into conveyor.

## How Automakers Mold Stainless Market

▪ Stainless steel producers are sweating out another tough one in the auto market.

With production of new models only a few weeks away, producers are not sure exactly what kind of stainless will be used on 1962 models.

**They know there will be drastic changes. In general outlines, the picture shapes up like this:**

**1. Type 430 which has been the standard for auto trim is going out of the picture.**

**2. The leading candidate for replacement of 430 is the new 433 or some variation.**

**3. Bright annealing, or some equivalent, will be required.**

But all details of the 1962 program had not been nailed down with one week gone in June. Type 433 stainless was introduced a few months ago by Allegheny Ludlum Steel Corp. It contains molybdenum and copper for added corrosion resistance.

**Good Reception**—The new grade has had a very favorable reception. An official of General Motors Corp. says flatly it will replace all 430 now being used on GM models. At least three producers besides Allegheny Ludlum have started melting the grade.

However, other producers are also working on their own versions of 433. One mill has submitted samples of a grade designed to give improved formability. An official of the mill feels auto specifications will be written in a way that permits composition variations.

**Alternates Tried**—A similar situation exists in the processing of automotive stainless. Auto plants have shown a fondness for bright annealing and most suppliers have equipped themselves for this process. (See IA, Dec. 15, p. 78) However, alternative methods are being tried.

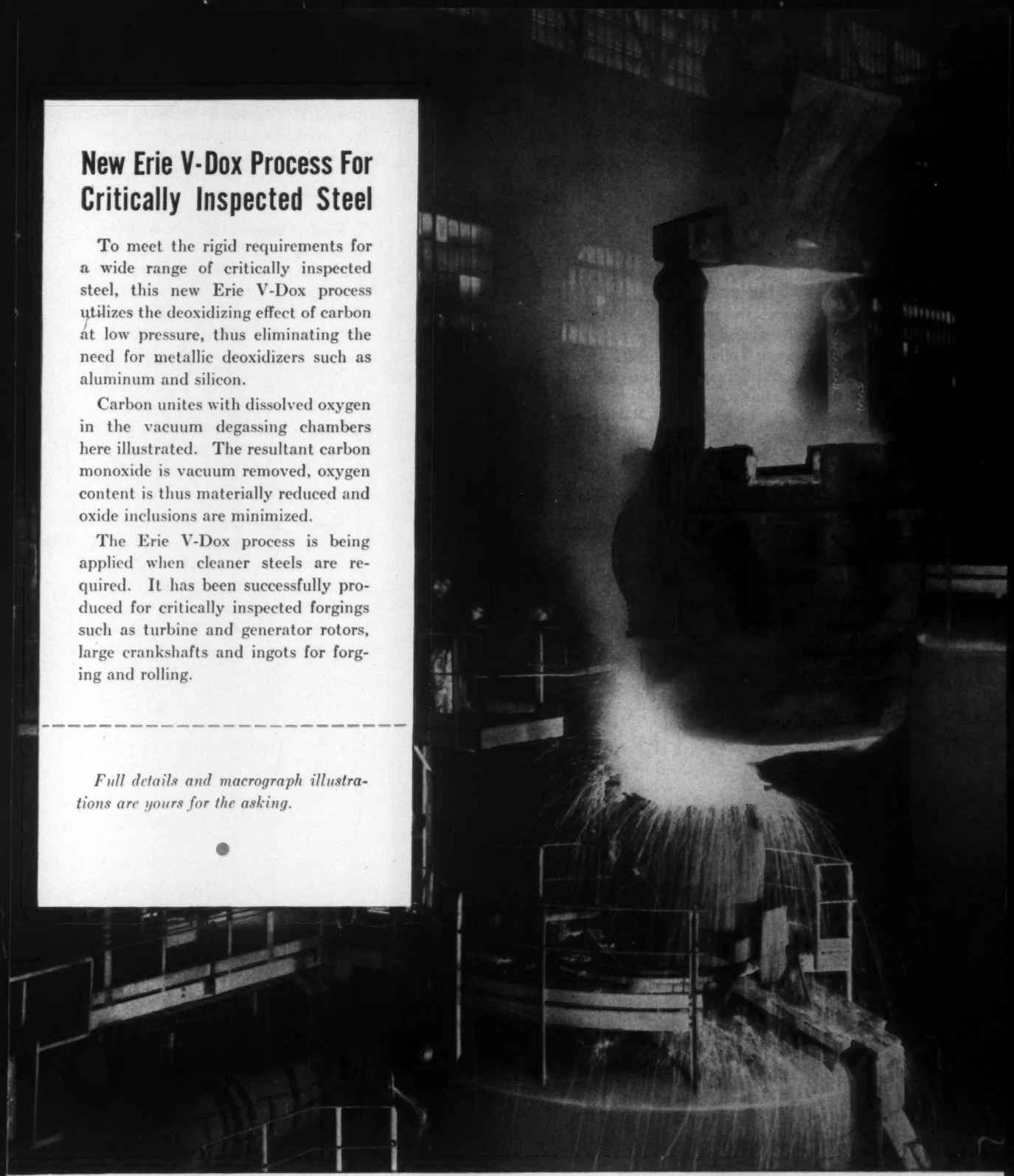
One mill is confident it can equal or surpass bright annealed quality by other means. With a new finishing facility installed and due to be announced, this mill is betting specifications will stick to quality and not single out any one process.

## IBM Creates New Computer Language

A new computer language, designed to broaden the use of numerically-controlled machine tools for automated production of complex parts, has been devised by International Business Machines Corp.

IBM calls its new system Autopromt. This stands for Automatic Programming of Machine Tools.

The company says the system is the first that enables the user to describe the surfaces of the three-dimensional shapes to be milled rather than each path the tool must follow. The computer generates these tool paths from a simple description in English-like terms of the part to be milled and the tool to be used, according to IBM.



## New Erie V-Dox Process For Critically Inspected Steel

To meet the rigid requirements for a wide range of critically inspected steel, this new Erie V-Dox process utilizes the deoxidizing effect of carbon at low pressure, thus eliminating the need for metallic deoxidizers such as aluminum and silicon.

Carbon unites with dissolved oxygen in the vacuum degassing chambers here illustrated. The resultant carbon monoxide is vacuum removed, oxygen content is thus materially reduced and oxide inclusions are minimized.

The Erie V-Dox process is being applied when cleaner steels are required. It has been successfully produced for critically inspected forgings such as turbine and generator rotors, large crankshafts and ingots for forging and rolling.

*Full details and macrograph illustrations are yours for the asking.*

**ERIE FORGE & STEEL CORPORATION**

ERIE, PENNSYLVANIA

## INDUSTRIAL BRIEFS

**Forge Foundation**—Drop Forging Assn. has set up a new educational foundation. Scholarships and lab equipment will be made available. The new institution will also sponsor college textbooks in forging technology.

**Authors Honored** — The Wire Assn. will present awards for papers at the annual convention in October. Winners include Gilbert D. Dill, Mishawaka, Ind., ferrous division; and Robert C. Lawrence, Jr., East Providence, R. I., nonferrous division.

**New President**—Michael P. Komar, Inland Steel Products Co., Milwaukee, has been elected president of Metal Roof Deck Technical Institute.

**Acetylene Choice**—C. G. Andrew, Air Reduction Sales Co., was elected president of International Acetylene Assn.

**Steel Service**—Stainless & Strip Div., Jones & Laughlin Steel Corp., received the annual Producer Award of the Steel Service Center Institute. It goes each year to the steel mill that conducts "the finest advertising campaign in the interests of North America's steel service centers."

**Precious Metals**—After transacting business in New York's famed financial district since 1867, Handy & Harman, the nation's largest precious metals company, has relocated its executive offices to 850 Third Ave. in midtown New York.

**Boice Choice**—Boice Gages, Inc., Hyde Park, N. Y., has acquired Reli-A-Chek Corp., Santa Maria, Calif. Boice makes precision measuring instruments. The new subsidiary will be renamed Reliant Gages, Inc.

**Western Move**—Thiokol Chemical Corp., Bristol, Pa., is acquiring Shawnee Industries, Inc., Shawnee, Okla. Shawnee will supplement Thiokol's rocket operations.

## U. S. Steel Unveils "Highway Hardware"

**NEW PROGRAM:** United States Steel Corp. has launched a new program featuring design concepts and complete engineering-fabricating data for "highway hardware" items. One idea for a sign support is this tapered box truss hung between two trussed cantilever columns. Discussing details are Robert C. Myers (left), U. S. Steel's director of market development, and Robert S. Holmes, highway construction marketing manager for USS.

**New Company**—Wallace Filters, Inc., Lebanon, Ind., has been formed by Charles I. Wallace, former president of Indiana Commercial Filters Corp. The new company will design and distribute all types of industrial filters.

**Name Change**—Burg Tool Manufacturing Co., Inc., Gardena, Calif., has changed its name to Burgmaster Corp. The company markets turret drills, tool holders and other machine accessories.

**Corporate Name**—Smith Welding Equipment Corp., Minneapolis, has a new corporate name and has opened a new division. The company has become a division of Tescom Corp., and has a new fluid systems division.

**Special Furnaces**—Amsler Morton Co., Pittsburgh, has received a contract from Bethlehem Steel Co. to build three carburizing and nitriding furnaces and one car type furnace at the Bethlehem, Pa., works.

**Allied Sale** — Michigan Chrome & Chemical Co., Detroit, has acquired Allied Research & Engineering Co., Hollywood, Calif. Allied will continue in the electroforming field.

**Overseas Entry** — Eaton Manufacturing Co., Cleveland, through Eaton Livia S.p.A., has purchased Officine Sant'Ambrogio S.p.A., of Turin, Italy, Sant'Ambrogio is the largest independent manufacturer of automotive engine valves in Italy.

**Fabricating Switch** — Virginia Steel Co. Div., Bethlehem Steel Co., is closing the Birmingham, Ala., fabricating plant on June 23. It will be moved to Starr, N. C., to be nearer its principal source of supply, the Bethlehem Sparrows Point, Md., plant.

**Surplus Sale** — General Services Administration is selling a surplus government - owned aluminum extrusion plant at Adrian, Mich., to Harvey Aluminum, of Torrance, Calif. Purchase price is $3.626 million.

# FUEL FOR THE JETS OF O'HARE

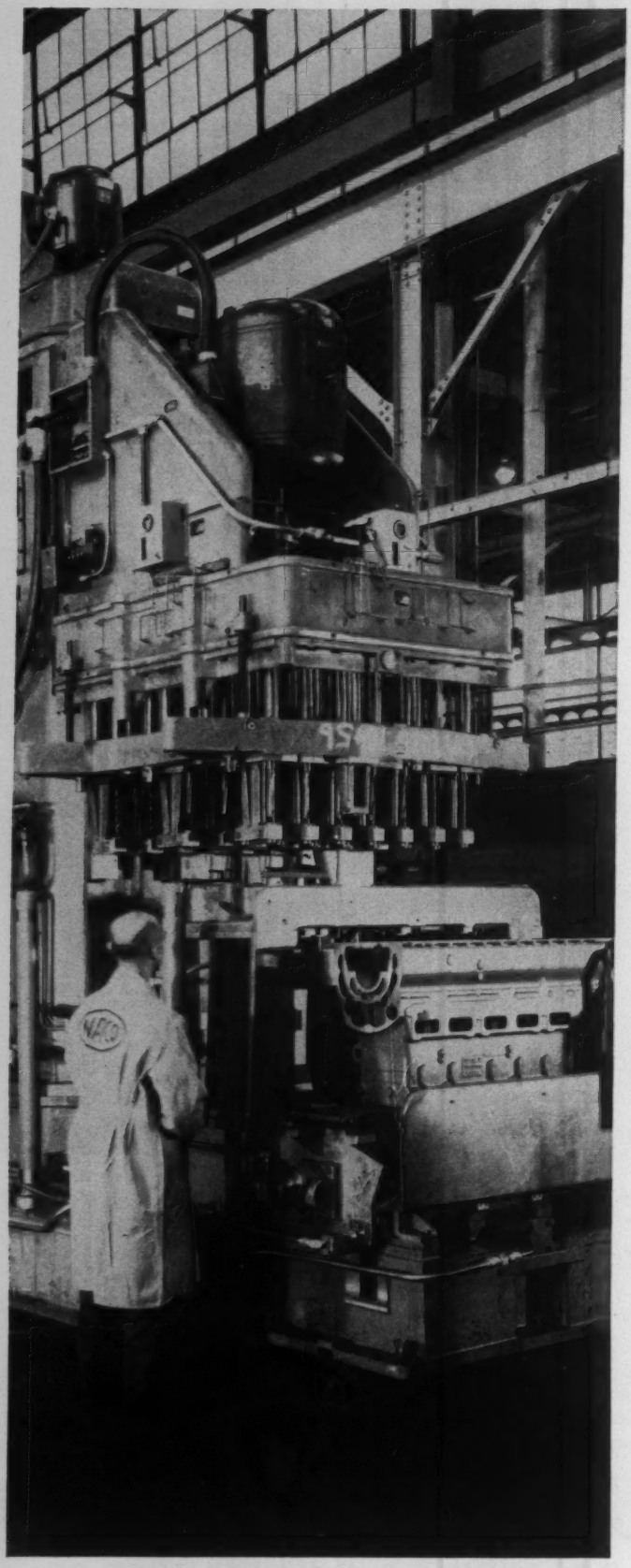
Two 20-foot two-leg bridle slings of 1⅛" 6 x 19 Yellow Strand handle these tanks.

## S. J. Reynolds Co. brings the Jet Age to O'Hare Field on Yellow Strand Slings

It took 21 stratalite jet fuel tanks, each holding 50,000 gallons, to slake the thirst of the big planes of the new air age at O'Hare Field, Chicago. The S. J. Reynolds Company of Cicero, Illinois, called on Yellow Strand safety slings to carry the burden of placing the 27-ton tanks in position. The reason – dependability. Yellow Strand slings are modern as the jet age – made better, built stronger to keep pace with modern needs. Whatever your sling need, call your Yellow Strand representative.

**Yellow Strand®**
**BRAIDED SAFETY SLINGS**

**BRODERICK & BASCOM ROPE CO.**
ST. LOUIS • PEORIA • HOUSTON • SEATTLE

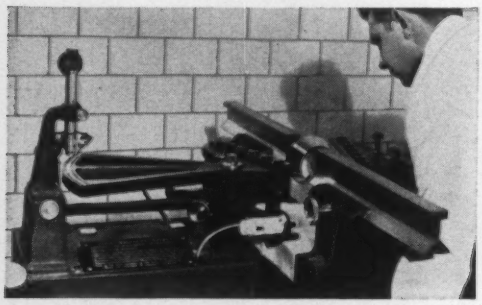


# How NATCO'S 87 spindles stay accurate

When National Automatic Tool Company designed this Model C5A-129 machine that drills, reams and counterbores, they had some tough problems. One was long-lasting accuracy for the 87 spindles requiring 174 bearings. The bearings used would have to assure accuracy under heavy loads at high speeds. And space limitations demanded that the bearings have maximum radial and thrust capacity in minimum space.

With the help of Timken Company engineers NATCO designers were able to select from the many types and sizes of Timken® tapered roller bearings, the one exactly suited for the job. The flanged cups of the 174 Timken bearings selected for the 87 spindles allowed shorter housings, through-boring for accurate alignment and saved space.

Spindle rigidity and accuracy are assured because the taper of Timken bearings lets them take *any* combination of radial and thrust loads. Full-line contact between their rollers and races provides extra load-carrying capacity.



**TOP BEARING ACCURACY** is assured because of our gage lab, the industry's finest. Some instruments we use measure even the thickness of several molecules, or split a hair 30,000 times.

The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.

Industry rolls on

**TIMKEN®**

tapered roller bearings

# How Managers Control Quality

**The top manager's role in quality control and improved reliability is indirect, but still vital.**

**Others may plan and direct the actual work, but the manager must effectively oversee and guide it.**

■ When plant equipment breaks down, when product rejects are too high, how much of the fault lies with management?

Behind most cases of process or product unreliability there's usually a technical explanation. The exacting work of quality control must be done by experts.

But, even so, final responsibility rests with management. More and more, top managers are finding other decisions tied to problems of quality control.

**Reason for Emphasis** — Expert after expert heard or quoted at last week's annual convention and exhibit of the America Society for Quality Control hammered away at this point. The reasons for more management emphasis are not hard to find.

"Excess manufacturing capacity, foreign competitive pressures, rapid equipment obsolescence, shrinking profit margins, and increasing consumer demand for better quality are all forcing manufacturers to evaluate quality costs as a means of remaining competitive."

This is the opinion of James L. Miller, manager of Machinery Automation Control Sales for the Waynesboro, Va., plant of General Electric Co. He adds that, in many industries, the cost of quality nears the total cost of direct labor or purchased materials.

**What's Needed**—What is management's function in the area of quality control? James N. Davis, deputy assistant secretary of defense, sees it this way: "It's management's responsibility to insure the closest working relationship between quality control, engineering, and design in spite of any discussions which obscure their common goal." He notes the value of the top man schooling himself on technical, production, and quality problems.

But, as always, communication is a problem. "Reliability is enmeshed in a highly sophisticated statistical - engineering language," says Mr. Davis. "This creates difficulties in communication."

He then relates a story of an executive who explained his staff contained about 300 physicists, 500 chemists, and 4000 engineers. "Sometimes," the manager noted, "I wonder whether we solve problems or trample them to death."

Another speaker, Thomas A. Budne, industrial consultant, outlined some of management's other responsibilities: Deciding on the most effective reliability philosophy for the company and its future. Effectively delegating responsibility for the effort. Providing optimum funds for both immediate objectives and long-range needs.

## Avoid These Pitfalls

■ To get at the realities of reliability, managers must sidestep a raft of "myths."

Some of these were debunked by C. M. Ryerson, product assurance administrator, RCA, Camden, N. J., in this way:

**Myth:** Industry has always been faced with the need for reliable products. Management, as always, must pass this responsibility on to technical men and not get involved.

**Answer:** "Top management is involved in reliability whether the individuals realize it or not. Effectiveness of the operation, efficiency of the organization, emphasis of the programs, and morale of the men all follow the example set by those in top command."

**Change or Disappear — Myth:** The average company can get all that's needed in reliability without special programs.

**Answer:** "These are changing times. Products are changing, techniques are changing. And organizational approach must change to keep pace."

**Myth:** If you try to measure product reliability, you just run costs up dangerously.

**Answer:** "In the near future the only companies left in the business will be those who know and are able to control the reliability of their product."

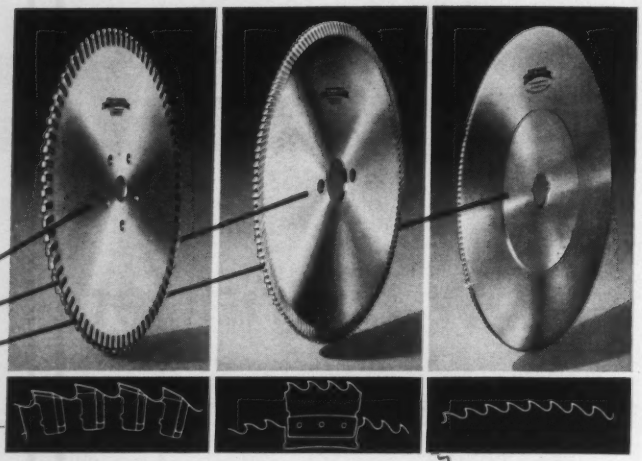
*Do you cut ferrous metals? If so, Simonds has three basic saw designs for you:*

**INSERTED TOOTH METAL SAWS**

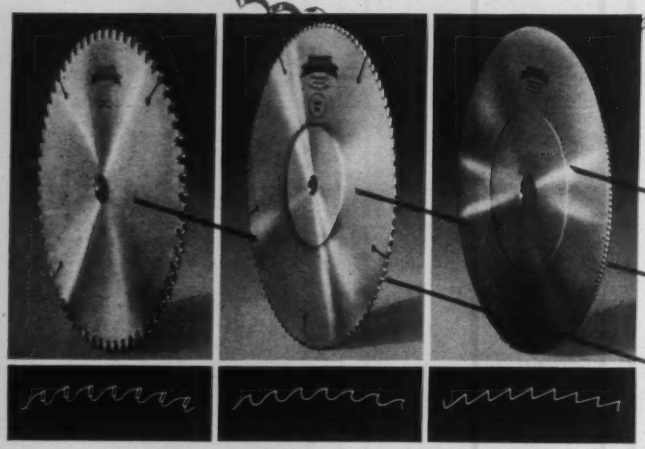
**SEGMENTAL SAWS**

**SOLID TYPE SAWS**

Available in High Speed and Semi-High Speed Steels



# There's a SIMONDS Circular Saw Exactly Right for Your Metal Cutting Job



*If you're cutting non-ferrous metals, Simonds offers you:*

**SOLID STEEL SAWS**
Available in "Si-Maloy", in High-Speed Steel for cutting where extreme abrasiveness is present, and in Semi-High Speed Steel.

**HIGH SPEED STEEL, HARD RIM SAWS**
Hard cutting edge, soft center gives you long life coupled with safety.

**CARBIDE TIPPED SAWS**
for cutting aluminum and magnesium, as well as other non-ferrous metals

No matter what kind of metal you're working, there's a quality Simonds blade just right — a blade that means faster, cleaner cuts, longer blade life and maximum performance.

Find out how a Simonds Circular Metal Cutting Saw can mean important savings for you.

INDUSTRIAL DISTRIBUTORS — THE RIGHT HAND OF PRODUCTION

**SIMONDS SAW AND STEEL CO.**

FITCHBURG, MASSACHUSETTS

Get your local Simonds Distributor's "TRIPLE-S-SERVICE" — For Local Stocks — Local Speed — Local Skill

Factory Branches in Boston, Chicago, Shreveport, La., San Francisco and Portland, Oregon • Canadian Factory in Granby, Que. • Simonds Divisions: Simonds Steel Mill, Lockport, New York; Heller Tool Co., Newcomerstown, Ohio; Simonds Abrasive Co., Philadelphia, Pa. and Arvida, Que., Canada

# Ford Develops Small V-8 Engine

## Motor Will Be Used on New, Small Fords

**Ford engineers are still reducing the size of a new V-8 engine developed for new 115-in. wheelbase Fords.**

**Latest plans call for a 200 cu. in. model. It may also be used in Falcons and Comets.**
**By A. E. Fleming**

■ Estimates are Ford Motor Co. has built about 90 of the small V-8 engines that it will come out with in the fall.

Size of the engine is diminishing. Four months ago engineers at the Cleveland Engine Plant No. 1 in Brookpark, O., were fairly certain a 260-cu in. model was what they wanted. Now they've reduced their sights to a 200-cu in. package that will produce about 140 hp.

**Refinements Likely** — Another production run is in the works for the first week in July, when 12 will be turned out. This seems to indicate the program still is in the rough stages since prototype schedules would run higher. So refinements can be anticipated.

Guesses are the engine will power not only the new 115-in. wheelbase models Ford will bring out, but perhaps the Falcon and Comet. Offerings probably wouldn't be extended to buyers of regular size cars.

**Smallest V-8**—The water-cooled, overhead valve engine has a cast iron cylinder block. But aluminum is used for parts such as the bell housing and water pump.

It will be the smallest V-8 in the business, a ranking currently held by General Motors Corp.'s 215-cu in., 155-hp package that is used in Buick Specials, Oldsmobile F-85s. It is offered optionally in Pontiac's Tempest. Ford's present V-8 is 292-cu in., 175-hp, a design the company will keep.

### Tough Quality Check Helps Lincoln Sales

Last week at a press showing, the Lincoln Continental was put through its paces in road tests at Wixom, Mich., where the luxury car is produced.

The program gave further evidence that auto makers are sending their quality or reliability programs into high gear.

**All Road-Tested**—Lincoln Continental is the only car on the market that carries a two-year or 24,000-mile guarantee.

Each car is put through a 50-minute, 12-mile road test. Other companies pick out cars at random as they leave the line and make "spot" road tests.

Whether it's this quality-proofing or not, the Lincoln is showing up much better in sales this year than last.

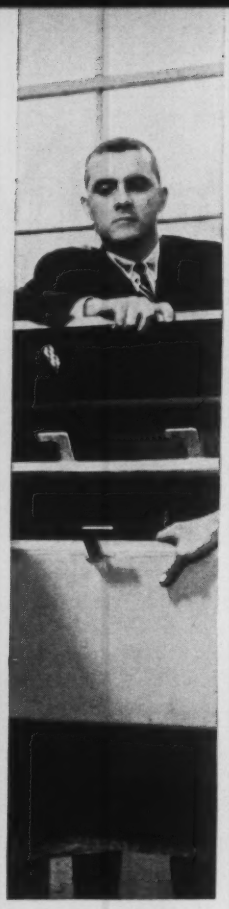
**Sales Hold Up Well**—It's believed that luxury car sales normally hit their peak in the first three months of the model year. But reports are Lincoln sales are holding up well in the second quarter of 1961.

---

## "Rolling Lobes" Take Sag Out of Cars

**FILL 'ER UP:** New "Super Lift" shock absorbers are adjustable for light or heavy loads. Fitted with a Goodyear "rolling lobe" air spring, they are made by the Delco Products Div. of General Motors Corp.

# ADD THIS SPECIALIST to your barrel finishing team



**Your Carborundum Barrel Finishing Specialist** can become an important means of cost reduction in your plant. He is trained in the most modern barrel finishing techniques. He has had practical experience in many plants where he has helped demonstrate that barrel finishing, properly applied, can produce precision results at low cost. He can advise you on the correct equipment and methods for deburring, grinding, polishing, burnishing, radii-forming, cleaning, descaling and many other operations which you might require. Put this specialist in your finishing picture... phone your local Carborundum distributor or district office. **CARBORUNDUM**

# Intellectronics Era Forecast

## Machines Will Free Humans for Creative Work

**Intellectronics, extending man's intellect electronically, will be our greatest industry.**

**That's the prediction of a leading scientist-executive, who sees machines doing routine work by 1971 while man creates. By R. R. Kay**

■ "Intellectronics will become the nation's greatest industry within ten years. Its impact will reach every industry, profession, and each citizen."

That's a prediction from Dr. Simon Ramo, executive vice-president, Thompson Ramo Wooldridge, Inc., Los Angeles. He's one of the country's top scientist-executives.

**Man/Machine** — What is intellectronics? Dr. Ramo says it's the science of extending man's intellect by electronics.

The man/machine partnership in intellectual activities for the world of the future will determine the relative position of nations, Dr. Ramo believes.

In this partnership, the machine will do the routine, repetitive work. Thus the human brain, its million-times-more-brilliant teammate, will be free for creative work.

**The Benefits**—Two things must be done: 1. Improve human brain power by education; and 2. Extend man's intellect by electronics. This will buy more benefits in social and scientific advances than if we concentrate on any other single field.

Some examples of the use of synthetic intelligence: Complete control of operations of a large chemical plant; translation of languages; sorting and examination of documents; air, highway traffic control.

In engineering, intellectronics has already proved out. Example: Simulation of thousands of ballistic missile flights.

### Will Reds Beat U. S. With 2000 MPH Plane?

Will the Soviet Union be first at the post again? This time with the first supersonic transport.

William M. Allen, Boeing's president, says, "The question is not whether such an airplane will be built, but when, by whom, and under whose auspices."

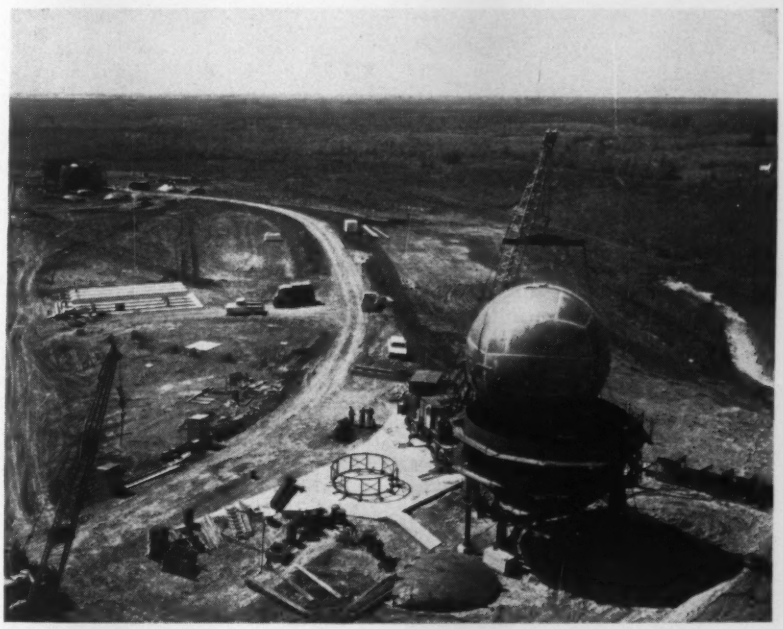
Mr. Allen believes that no one company or group of companies can "go it alone" in developing a 2000-mph transport. It will cost $700-$800 million, exclusive of engines, to deliver such a plane.

**Few Funds**—The Federal Aviation Agency favors a combined government - aerospace industry program to develop a commercial supersonic airliner.

But as of now, the Administration has asked for only $12 million —to be split among several companies. But even that might have tough sledding in Congress.

Rumors persist that the Soviet Union is well along the way to building a supersonic transport.

## Space-Age "Volleyball" Will Fuel Saturn



**TANK WITHIN TANK:** Spherical tanks to store liquid hydrogen fuel for the Saturn S-IV rocket have been completed at Douglas Aircraft Co.'s Sacramento, Calif., test facility. The two storage vessels are each a tank within a tank. Each will hold 90,000 gallons of high energy propellant.

# We've taken off our shine, too

**Every National oil seal is now phosphate coated to inhibit rust**

Other oil seals are still shiny. But look what National gives you in place of the gleam: an exclusive phosphate coating that improves rust resistance by "holding" rust-preventing lubricants to the seal's metal surfaces. The result is superior rust resistance on the shelf . . . *and on the shaft* where condensation is a constant peril to seal life.

This phosphate coating has another important advantage. It provides better adhesive properties and makes possible a more positive bond between metal retaining parts and Syntech rubber sealing members. This gives you a better seal with longer life.

Phosphate coating is just one of the "extras" in National seals. And with National you choose from a complete line with both Syntech rubber and Micro-Torc® leather seals in practically every type and size. When you need seals . . get the best. Call your National Seal Distributor.

**NATIONAL OIL SEALS**

FEDERAL-MOGUL SERVICE

DIVISION OF FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 13, MICHIGAN

# Computers: A Production Cure?

## Machine Tool Builders Say They May Be the Answer

**Many machine tool builders say electronic computers are proving to be vital engineering and administrative aids.**

**Though they can't replace the human engineer, they can help solve many production problems. By R. H. Eshelman**

■ Machine tool builders are finding that electronic computers can be highly useful engineering and administrative aids. And some companies say these "mechanical minds" could be just the cure for complex production problems.

Though the robot brain works like lightning, it can only sort out data previously fed to it. And it only understands the simplest terms. That's why one machine tool authority calls the computer a "high-speed moron."

But look at what this moron can do:

**Streamlining**—Cross Co., Detroit, has put a computer's memory to work keeping track of 9000 odd parts that go into a complex transfer machine. Company executives say computer techniques streamline scheduling, avert many bottlenecks.

Another builder, Michigan Tool Co., uses an electronic computer to design highly complex gear-cutting tools. Engineers feed gear data with design variations and modifications involved into their electronic helper. In less than 15 minutes, the computer types out specifications for the optimum design. And it supplies the shop with instructions for making the tool.

The Cross Co. installation shows that, despite operating on a jobshop basis, a special machine builder can put into practice the production philosophy he preaches—use of automated production control and design engineering to gain higher efficiency.

**TAPE MEMORY:** Machine tool builders are using automated methods more and more in their operations. Here's a new horizontal tape-controlled drilling machine, developed by DeVlieg Machine Co., Mich.

**Problem Solved**—Cross solves the problem of technical complication by identifying each machine part with a punch card. As each critical step in its production is completed, the information is transferred to the card. The computer stores all this knowledge on current status of every part.

When a part begins to fall behind schedule, it shows up as a red flag on the computer's past-due report. This high-speed processing of running data gives an overall picture of every machine being built in the shop. By comparing the different types of computer reports, executives quickly see where to place the work emphasis.

In extreme cases, such as a sudden order influx, management can see where the solution might be an extra shift or outside work.

**Gathering Pieces**—Basically, the computer rapidly gathers many pieces of information. Each little bit relates to the others in the total picture. Then it automatically provides data for reports on the overall result.

Thus management has an accurate view of what is going on at any moment and can take corrective action immediately, if necessary. Speed, capacity, and accuracy of the computer are its most vital characteristics in this type of work.

# WHO SAVES WITH THE A-L TOOL STEEL STEELECTOR SYSTEM?

## *EVERYBODY DOES!*

If part of your job deals with tool steel, you can save time and make your work easier by using the Allegheny Ludlum STEELECTOR System. And you will be saving your company money. Check this list to see how the STEELECTOR Program can help you:

**Owner, president, vice president** Reduces costs in warehousing and purchasing. Insures selection of the right tool steel—prevents misapplication and wrong heat treatment.

**Operating man, superintendent, foreman, production control man** Ends availability problems. Large local warehouse stocks enable you to reduce your own stocks. Consistent high quality.

**Engineer, metallurgist** Speeds selection of the right tool steel—saves selection time for jobs that need it.

**Specifier, designer, toolroom man** Assures you of the availability of the size and grade you need. Only 18 grades to consider for 96 percent of all applications.

**Stockroom supervisor** Saves storage space because fewer grades are needed. Ordering, paper work are reduced.

**Heat treater** Helps you operate furnaces more profitably—more tools can be treated at a time.

**Purchasing agent** Reduces paperwork and inventory needs. Makes your job easier.

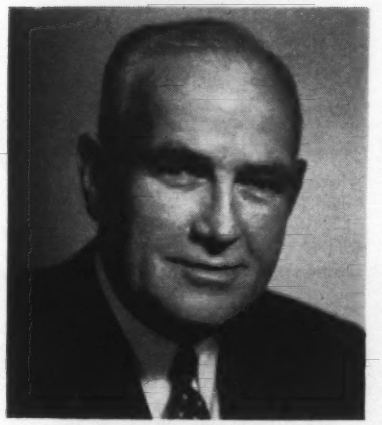
For more information ask your Allegheny Ludlum salesman for your copy of the colorful STEELECTOR Booklet, or write: *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania. Address Dept. A-6.*

3242

STEELECTOR PROGRAM

**ALLEGHENY LUDLUM**

Tool Steel warehouse stocks throughout the country



**Guy J. Coffey,** elected chairman of the board and chief executive officer, Chicago Pneumatic Tool Co.

---

**Chrysler Corp.**—D. M. Borden, appointed chief engineer, automotive research, Engineering Div.; I. J. Minett, named group executive and chief operating officer, International Operations Group.

**Chicago Pneumatic Tool Co.**—T. F. Noonan, elected vice president and comptroller; C. L. Lane, elected vice president and manager, plant operations.

**Lyndhurst Steel & Aluminum Corp.**—Lee Podnieks, named asst. to the president.

**Sharon Steel Corp.** — J. A. Roemer, elected president in addition to duties as chairman of the board; H. G. Evans and W. J. McCune, elected directors.

**Youngstown Steel Car Corp.**—E. J. Sherwood, elected vice president, sales, and a member of the board; T. J. Healy, appointed asst. secretary and treasurer.

**Signode Steel Strapping Co.**—J. M. McGregor, elected senior vice president; H. P. Young, elected vice president, Manufacturing Div.; Hugh Bunten, elected vice president and secretary; J. F. Beckman and M. C. Carlson, elected vice presidents, Sales Div.; A. N. Perry, elected asst. vice president, Sales Div.

**Cincinnati Steel Castings Co.**—Jerry Leary, elected executive vice president.

**Copper Range Co.**—C. L. Nielsen, elected vice president, finance.

**Bethlehem Steel Co.**—J. O. Dague, named asst. general manager, Steelton plant.

**General Electric Co.**—H. M. Wittner, named manager, marketing, missile and space vehicle dept.; E. L. Kapernaros, appointed manager, diamond application engineering, metallurgical products dept.; C. S. Martin, appointed midwestern sales manager, insulating materials dept.

**Norman Readman,** elected president, Chicago Pneumatic Tool Co.

---

**Youngstown Sheet and Tube Co.**—Howard Van Meter, named superintendent, blast furnaces, Brier Hill plant.

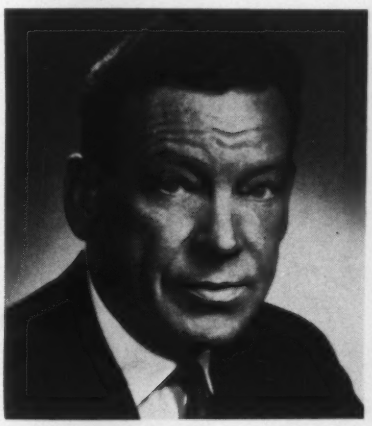
**Lewis Steel & Aluminum Co., Inc.**—R. L. Fountain, appointed treasurer.

**Daystrom, Inc.**—J. S. Burr, appointed marketing manager, Control Systems Div.

**Carpenter Steel Co.**—J. S. Kline, named director, general services; Barclay Morrison, named general manager, Alloy Tube Div.

**(Continued on P. 98)**

**D. H. Bissell,** named chairman of the board, Chromium Corp. of America.



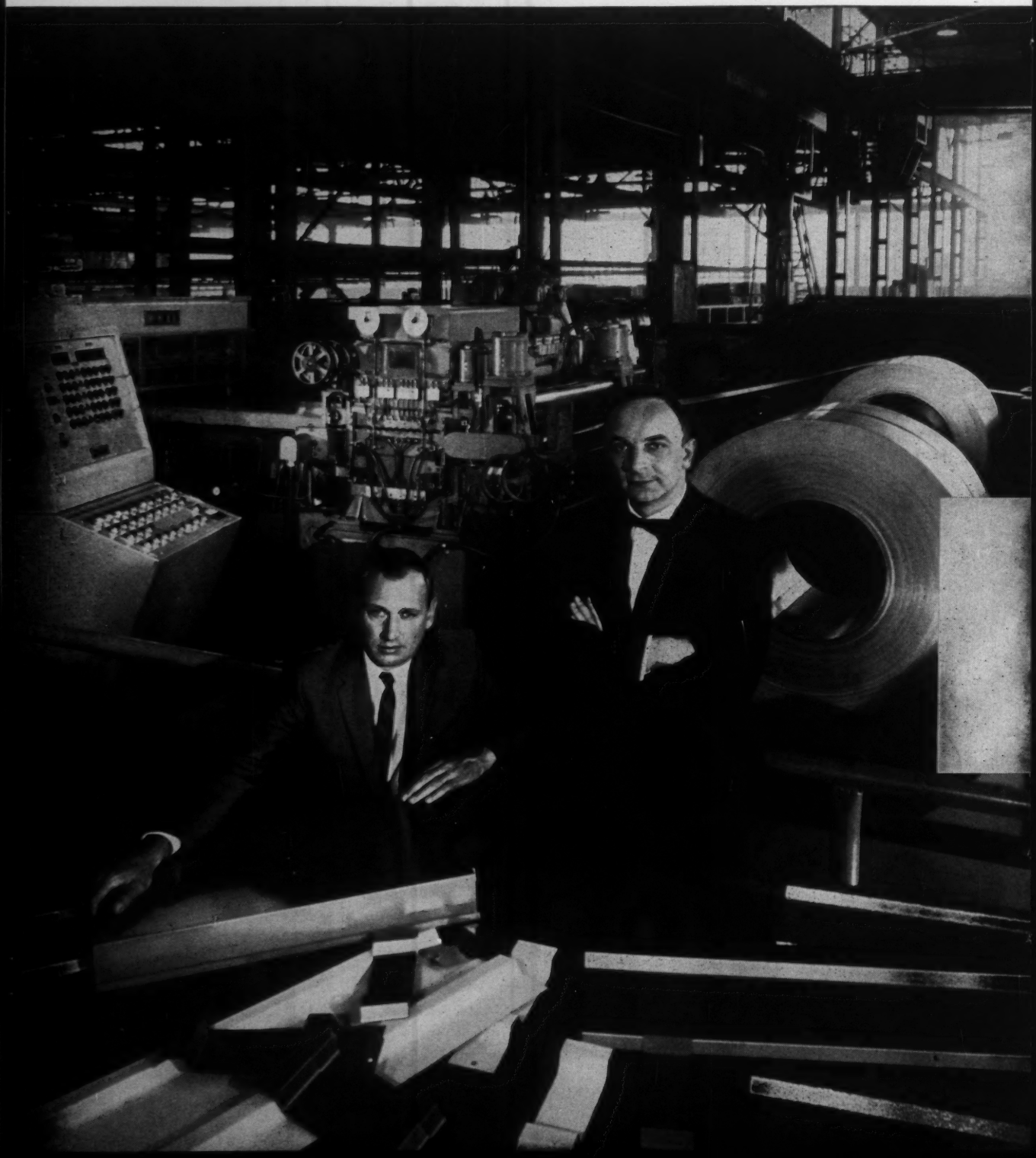
**W. J. Zubrisky,** elected president and chief executive officer, Chromium Corp. of America.

**R. H. Isbrandt,** elected vice president, automotive engineering and research, American Motors Corp.

**McKAY DIE SHEAR LINES CUT MORE THAN STEEL.** The most economical and efficient shear lines in operation today, they are being used by dozens of leading metal producers, fabricators and warehouses to slash shearing costs. Here, McKay Sales Manager Joseph F. Lyden, Jr., and M. G. Slaney, Building Division Manager, The Parkersburg (W. Va.) Rig and Reel Company —one of the nation's fastest growing manufacturers of pre-engineered metal buildings— examine panel sections cut to length by the high speed McKay Die Shear Line in the background.

# This is McKay

Photo by Arnold Newman



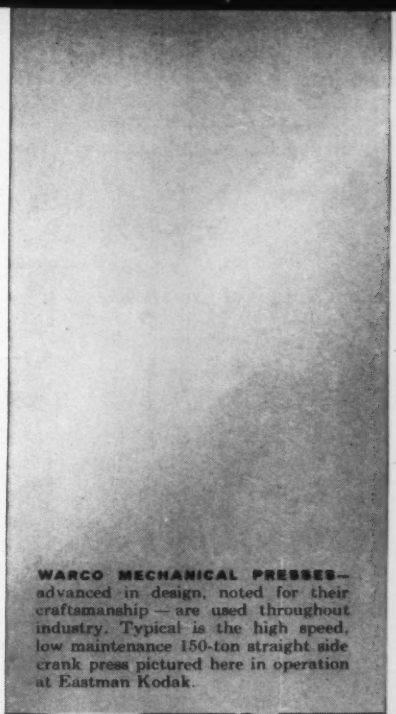
# Machine....

*a recognized leader in the development and manufacture of high production metal processing equipment!*

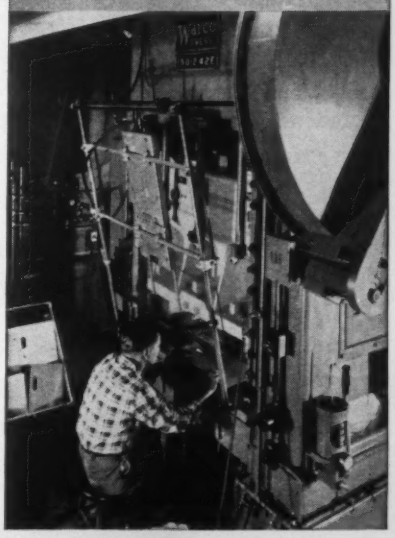
If you fabricate metals and are caught in the "profit squeeze" you'll want to know more about McKay Machine.

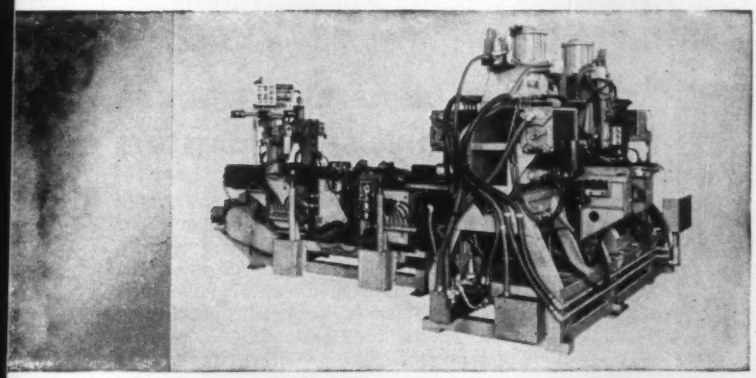
It was McKay Machine that pioneered automated integrated production lines, and it is McKay Machine that is today a leader in this field. We have conceived and produced complete lines for the manufacture of building panels, aircraft and missile sections, appliances, cabinets and components, automotive bodies and parts, and farm equipment—lines that are completely automated from *raw material to finished part or product.*

Whatever you make, if it requires metal handling, feeding, slitting, shearing, stamping, welding or forming, it's just good business to acquaint yourself with *McKay Packaged Production Lines*—high speed production equipment engineered to work in unison—with one-source responsibility from start to finish. Write for literature to *The McKay Machine Company, Youngstown 1, Ohio.*



**WARCO MECHANICAL PRESSES**—advanced in design, noted for their craftsmanship — are used throughout industry. Typical is the high speed, low maintenance 150-ton straight side crank press pictured here in operation at Eastman Kodak.

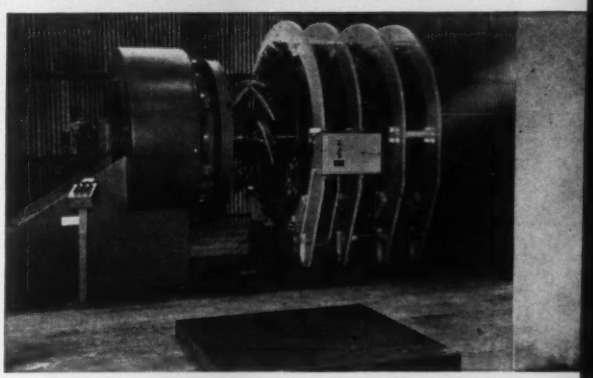




**FEDERAL RESISTANCE WELDERS AND WELDING LINES,** like this multi-gun combination spot and projection welder used by Hotpoint on their range production line, can be found in the plants of leading metalworking firms the nation over. Individual units, or complete resistance welding lines, are engineered to specifications by McKay's Federal-Warco Division.

**LOOK TO**

**McKAY MACHINE**



**BERKELEY-DAVIS AUTOMATIC ARC WELDING MACHINERY** produced by Berkeley-Davis, Inc., a subsidiary, is highly popular in the aircraft, rocket, automotive and appliance industries. The rocket body welder pictured here is working at Aerojet General, subsidiary of General Tire and Rubber Company.

(Continued from P. 95)

**Koppers Co., Inc.**—J. E. Meyers, appointed manager, coupling dept.

**Pratt & Whitney Co., Inc.**—L. V. Quin, appointed branch representative, Cleveland.

**Chromium Corp. of America**—J. J. Cassidy, elected controller.

**J. F. Knight,** appointed vice president, operations, Kaiser Refractories Div., Kaiser Aluminum & Chemical Corp.

**Caine Steel Co.**—D. L. Snyder, named asst. product manager, Chicago Div.; Jack Doane, named regional representative.

**Clark Controller Co.**—Burl G. Robertson, named district manager, Birmingham, Ala., district; Bill Suk, named Southeastern regional manager.

**S. A. Frankel,** appointed vice president and director, corporate development, Luria Bros. & Co., Inc.

**General Motors Corp.** — R. D. Goodwin, named superintendent, Tool Manufacturing, Delco Products Div.

**Kaiser Steel Corp.**—D. W. Keirn, appointed asst. manager, plate, structural and bar sales.

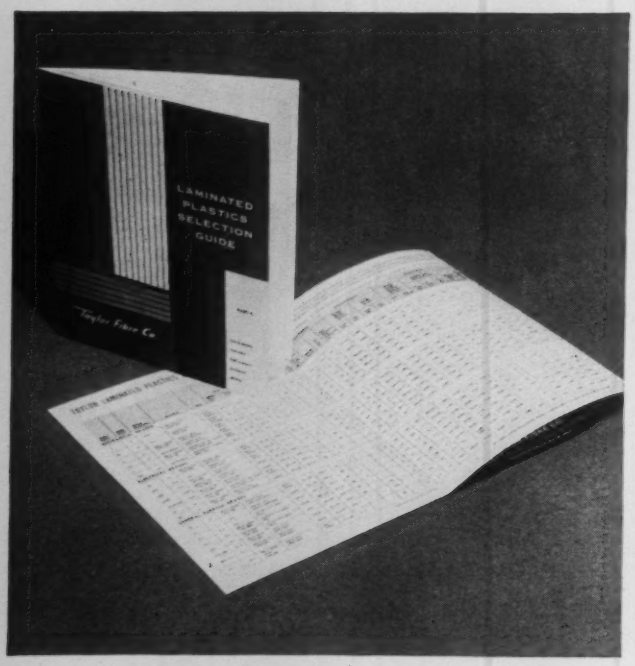
**Reynolds Metals Co.** — W. E. Campbell, named manager, aluminum reduction plant, Troutdale, Ore.

**Titan Metal Manufacturing Co.**—J. W. Dunner, appointed sales representative for Virginia, Eastern West Virginia, and most of Maryland.

**Wilton Tool Manufacturing Co., Inc.** — Thomas Walsh, appointed district sales manager.

**Curtiss-Wright Corp.**—J. P. Larson, appointed quality control manager; R. S. Francekovic, appointed plant manager, Turbo Products plant; C. E. Sutherland, Jr., appointed asst. to the works manager, Marquette Div.


# Specifying LAMINATED PLASTICS...as sheet,

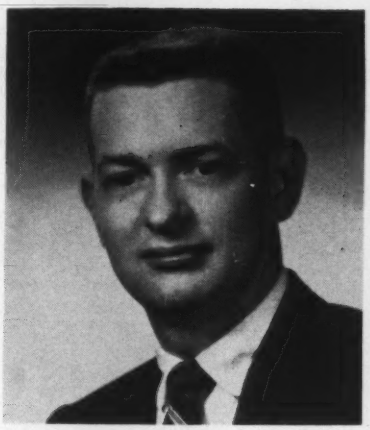



Use this Taylor Selection Guide to make selections of the Taylor laminated plastics that will fit your requirements.

## TAYLOR FIBRE CO. BELONGS IN YOUR SPECIFICATIONS

**Taylor has the products:** . . offers more than 50 grades of industrial laminated plastics . . . including paper, cotton cloth, nylon, asbestos, glass cloth, or other base material impregnated with phenolic, melamine, silicone or epoxy resins and formed into sheets, rods and tubes under heat and pressure. Also a number of composite materials, including copper-clad laminated plastics, vulcanized fibre and laminated plastics, rubber and laminated plastics, asbestos and laminated plastics, and aluminum and laminated plastics.

**C. C. Hanson,** named vice president and general manager, Trenton Div., Ajax Magnethermic Corp.



**J. K. McLaughlin,** named vice president, Youngstown Div., Ajax Magnethermic Corp.

**Merkle-Korff Gear Co.**—Walter Strand, elected president; John Simms, elected vice president.

**Firth Sterling, Inc.**—H. J. Alverson, Jr., elected treasurer-comptroller; C. N. Gillespie, elected secretary and asst. treasurer; D. A. Tyree, elected asst. secretary.

**J. I. Case Co.**—D. A. Milligan, named general manager, marketing and product development; J. P. Cody, named general sales manager, Industrial Div.; R. P. Meyers, appointed Industrial Eastern Div. manager; J. R. Haley, named North Central Regional manager.

**Stanley Works**—W. F. Oswalt, elected executive vice president and appointed a director.

**Foseco, Inc.** — Jack Parmenter, appointed technical sales representative, Chicago.

**General Precision, Inc.**—J. R. Harkness, appointed vice president, marketing, Librascope Div.

## OBITUARIES

**R. F. Sparrow,** 63, executive vice president, P. R. Mallory & Co., Inc.

**C. M. Adams,** 56, superintendent, Troy, N. Y. blast furnace, Republic Steel Corp.

**W. F. Schupp,** St. Louis district sales manager, Republic Steel Corp.

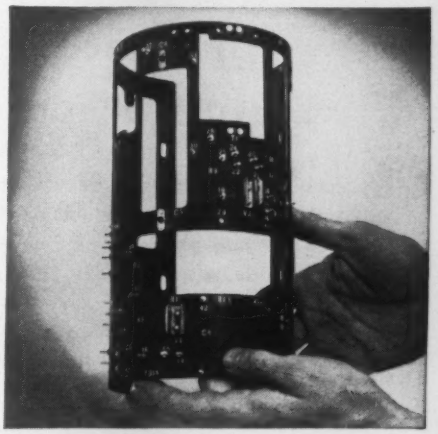
**D. A. Shardelow,** 59, Detroit district sales manager, Republic Steel Corp.

**H. E. Graffin, Jr.,** 60, manager of sales, Alloy Bar Div., Bethlehem Steel Co.

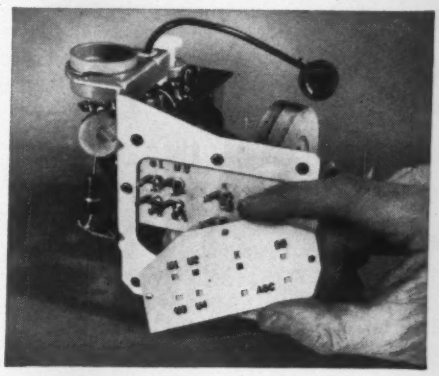

# rod, tube or fabricated parts?

**Taylor has the facilities.** Its Norristown, Pa., plant, comprising some 300,000 sq. ft., produces both laminated plastics and vulcanized fibre . . . is one of the most completely integrated in the industry . . . even makes its own paper and a large percentage of its own resins. The La Verne, Calif., plant, with over 45,000 sq. ft. of floor space, specializes in the manufacture of laminated plastics for the convenience of West Coast customers. And both plants can fabricate parts from any Taylor materials to specifications, economically.

Taylor laminates offer many advantages over metals. They have a higher strength-to-weight ratio, are corrosion resistant, and can be fabricated more easily. This Taylor Selection Guide will help you evaluate the different grades available. Write for your copy today. Taylor Fibre Co., Norristown 52, Pa.



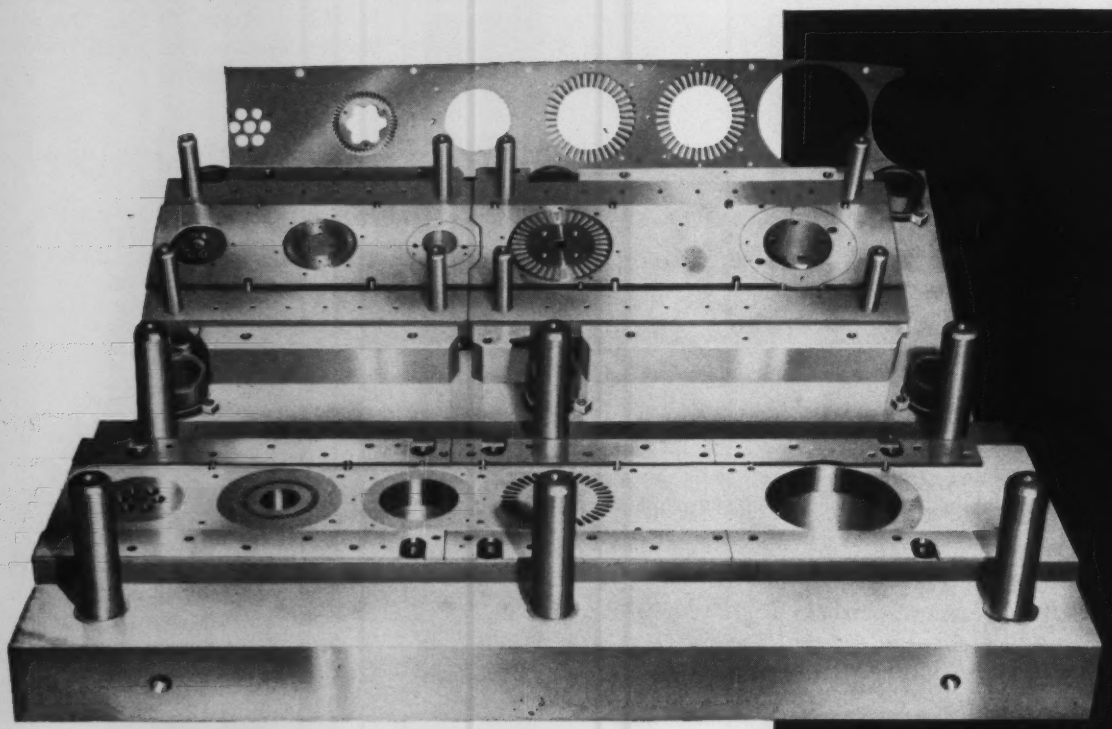
For applications requiring high strength retention at elevated temperatures, Taylor Grade GEC—an epoxy resin, glass fabric base material.



For high-temperature electrical applications and high-frequency radio equipment, Taylor Grade GSC—a silicone resin, glass fabric base material. Has high heat resistance, excellent electrical properties, and high arc resistance. Will not support combustion.

Taylor

LAMINATED PLASTICS VULCANIZED FIBRE



# LAMINA CARBIDE DIES

## with Lamina-Bronze Guide Pin Bushings

Carbide dies designed and built by Lamina assure full realization of your production requirements. Lamina-bronze guide pin bushings are wring-fit in the die shoe to provide distortion-free, full-bearing surfaces that result in better die alignment, less maintenance and longer die life. For more accurate press operation, higher production and lower costs—standardize on Lamina dies and details.

Lamina®

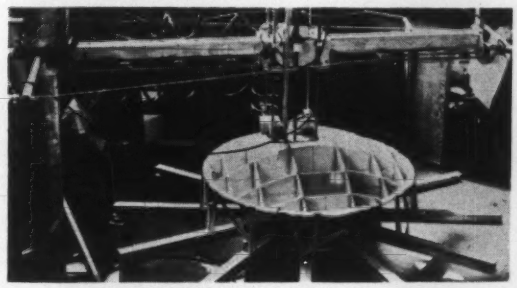
**DIES AND TOOLS, INC.**

**P. O. BOX 31, ROYAL OAK, MICHIGAN**

WE WOULD BE PLEASED TO QUOTE ON YOUR CARBIDE DIE REQUIREMENTS

## Antenna Has Foam Reflector

Using a lightweight foam reflector, a new antenna aids satellite communications and radar and radio astronomy. The newcomer's main advantage centers on the simplicity with which it's made. To fabricate the reflector, styrofoam boards



**TAPED MILLING:** Shapes foam reflector.

are joined with foamed seams to yield a cellular structure that resembles an egg crate. Then a computer-controlled mill shapes each reflector to the desired parabolic contour.

## Space-Age Insurance

NASA is seeking authority to insure space contractors against catastrophes caused during work on super-rocket boosters. The agency asked Congress for authority to underwrite up to $500 million in high-risk space work. James E. Webb, head of NASA, says: "Contractors working on advanced space projects may face risks that can't be covered by available insurance."

## Women Spacecraft Drivers?

The rendezvous of space vehicles with each other while in orbit around the earth will be controlled by spacecraft pilots. This will eliminate complex automatic controls. Incidentally, women may be better space drivers than men. These are two conclusions which have emerged from spaceflight simulations at The Martin Co.

## Satellite Watchdogs

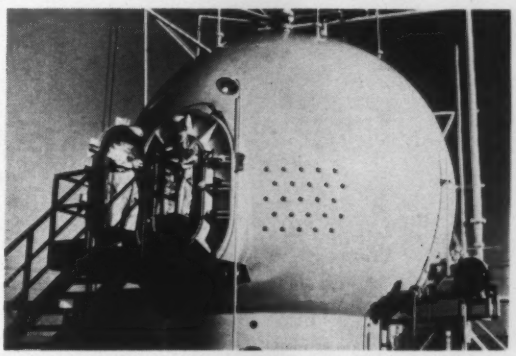
Space watchdogs to locate and inspect hostile satellites orbiting the earth may be operating within two years. These space sentinels will take the form of the Saint inspection satellite, undergoing tests by the Defense Dept. Pentagon engineers report the Saint may be ready to blast off "in a couple of years." It's a 4000-lb vehicle, complete with integral radar system.

## Detects Odd-Ball Atoms

**Researchers at RCA have a machine that detects one foreign atom lurking among more than a million native atoms. Called a spark-source mass spectrograph, this instrument probes electronic materials that will serve in tomorrow's computers, communications systems and control units. One impure atom in a given composition can alter a space-age metal's electrical properties.**

## Searching for Solid Fuels

Testing of solid fuels takes a new twist at the Esso Research and Engineering Co. An 18-ft sphere, designed to simulate space conditions, houses a tiny rocket and a one-eyed one-armed



**MINIATURIZED TESTS:** May hold answer.

robot. The robot's eye, a TV camera, projects what it sees to a control room. If a solid fuel shows promise in the calculation stage, gram-sized samples are made up and tested.

## Federal Space-Talk Funds

The Government has switched its stand on communications satellites. Instead of just supplying rockets, Uncle Sam will share the costs of complete communications systems with industry. In return for this investment, the Government will use the systems for propaganda.

# MIRROR FINISH FOR A PERFECT FOIL

*Midvac Rolls*

## FORGED FOR EXTRA SERVICE MADE FOR BETTER FINISHES

Made from consumable electrode vacuum arc melted Midvac Steels with super uniformity of fine grain structure . . . maximum freedom from defects and non-metallic inclusions. Machined and ground to a black lustre, Micro-Lustre finish that assures rolling free of surface imperfections . . . quicker re-polishing . . . longer trouble-free service between grinds. These are the qualities of Midvac Rolls.

These vacuum melted finishing rolls are made to last longer and produce products unsurpassed in fine finishes. These rolls have cut repolishing time in half . . . lasted 33% to 50% longer on mill between grinds.

For a higher standard of quality and lower maintenance costs specify Midvac Rolls for your mill. Midvale-Heppenstall also makes forged steel rolls of any size, for any purpose required in the rolling of steel, aluminum, copper, bronze and other metals . . . as well as paper, plastics and rubber. Write for complete details to . . .

**MIDVALE-HEPPENSTALL COMPANY • NICETOWN, PHILADELPHIA, PA.**
SUBSIDIARY OF HEPPENSTALL COMPANY, PITTSBURGH, PA.

H MH *Midvac Rolls*

VACUUM AND CONSUMABLE ELECTRODE STEELS • BACK-UP ROLL SLEEVES • FORGED STEEL ROLLS • FORGINGS
RINGS • PRESSURE VESSELS • INDUSTRIAL KNIVES • DIE BLOCKS • MATERIALS HANDLING EQUIPMENT

# Cold Extrusions Forge Ahead

## Demands for Cold-Extruded Steel Parts Hit Record High

**Automatic cold-forging lines transform raw bar stock into complex finished-steel shapes.**

**These lines use deep-drawing, heading, flattening, preforming and coining methods.**

■ For generations, one of man's dreams has been to form cold steel as easily as you shape a piece of putty. Thanks to the cold-extrusion process, this dream is a reality.

Despite stiff competition from long-established manufacturing methods, cold forging has found its niche in metalworking. Demands for cold-extruded steel products are setting record highs.

**Complete Process**—Cold forging lends itself to mass production only. With advanced planning it's a complete forming process, not just a single-stage machining operation.

From raw steel bars to finished parts, the cold-extrusion process competes with other proven methods. Dr. H. D. Feldmann, Technical Director, Cold Forging Ltd., Sunbury-on-Thames, England, reports: "Savings of 50 pct in raw material are common when raw bar stock is cold forged. The preparation of hot forgings, on the other hand, wastes lots of raw metal."

Cold extrusions also challenge chip-forming methods of manufacture. Some parts can be cold forged to final dimensions. In other cases, a skim-finishing cut brings a shaped forging to final size. In all cases, metal savings prove noteworthy.

**Good Tool Life**—In cold-forging work, tool life is relatively good. Of course, final tolerances hinge on tool wear. But a quick touch-up or a timed exchange of dies and punches can keep tooling costs down.

For best results in cold forging, all workpieces should be phosphated. A phosphate layer reduces friction during cold-working operations.

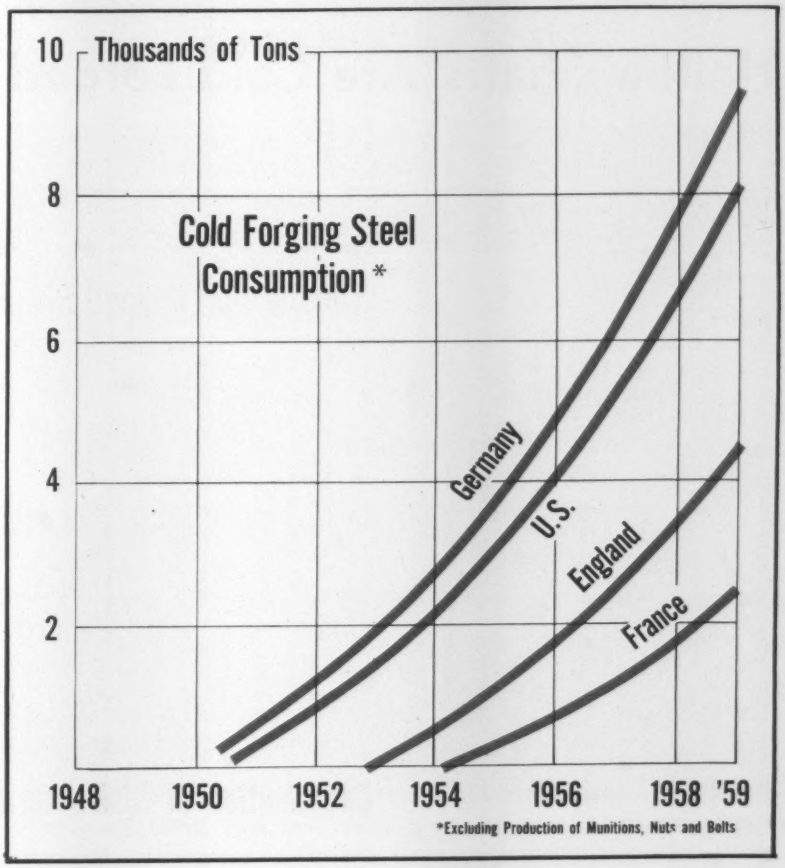
Cold forging creates a hardening effect. This effect, together with the remaining phosphate layer, also yields a good surface finish.

**Inhibits Corrosion**—When as-extruded parts are stored or shipped, the remaining phosphate layer guards against corrosion. But this left-over lubricant causes headaches if the cold-forged parts have to be soldered, brazed or welded.

How do you design a part for cold forging? First, make a drawing that shows the final shape. Show all sectional views true to scale, plotting all radii with exact measurements. At this stage, you should decide which tolerances are imperative and can't be extended.

Now, you're ready to consider physical properties. If necessary, a

## Germans Lead Western Nations



### Quantities Dictate Costs

| Part Weight | Number of Pieces, Min. | |
|---|---|---|
| | Standard Extrusion | Special Extrusion |
| 0.035-0.70 oz | 10,000 | 500,000 |
| 0.70-17.5 oz | 5,000 | 200,000 |
| 17.5 oz to 22 lb | 3,000 | 100,000 |
| 22-77 lb | 1,500 | 50,000 |

follow-up heat treat can be applied to the forged parts. With proper tempering, it's easy to case harden the finished shapes.

**Surface Finish** — Obtaining the desired surface condition may or may not be easy. If the parts are ready for use in the as-extruded condition, there shouldn't be any problem.

However, if you have to remove the remaining phosphate layer to weld, solder or braze the parts, then you must sacrifice some of the surface finish. Phosphate removal roughs up the smooth cold-forged surfaces. In such a case, you must allow enough material on each extruded part for a skim-finish cut.

Of course, in the design stage you should estimate the quantity of finished parts needed. Remember, the cold-extrusion process can't compete on a cost basis, unless the parts are mass produced. A short table lists minimum workruns for various forged-part weights.

**Initial Tooling** — Tooling consists of forming dies, punches and cutting dies. When parts are cold forged on a contract basis, most manufacturers charge part of the tooling costs to the customer.

Let's study a typical cold-forging setup. Most lines include cropping machines, a surface-treatment room, preform units, deburring and chamfering installations and finally the cold-forging equipment.

One of the prime requirements in cold forging centers on accurately-sized blanks. Generally, the blanks are made from steel rod or tubing. Some automated cropping machines turn out 60 blanks per minute.

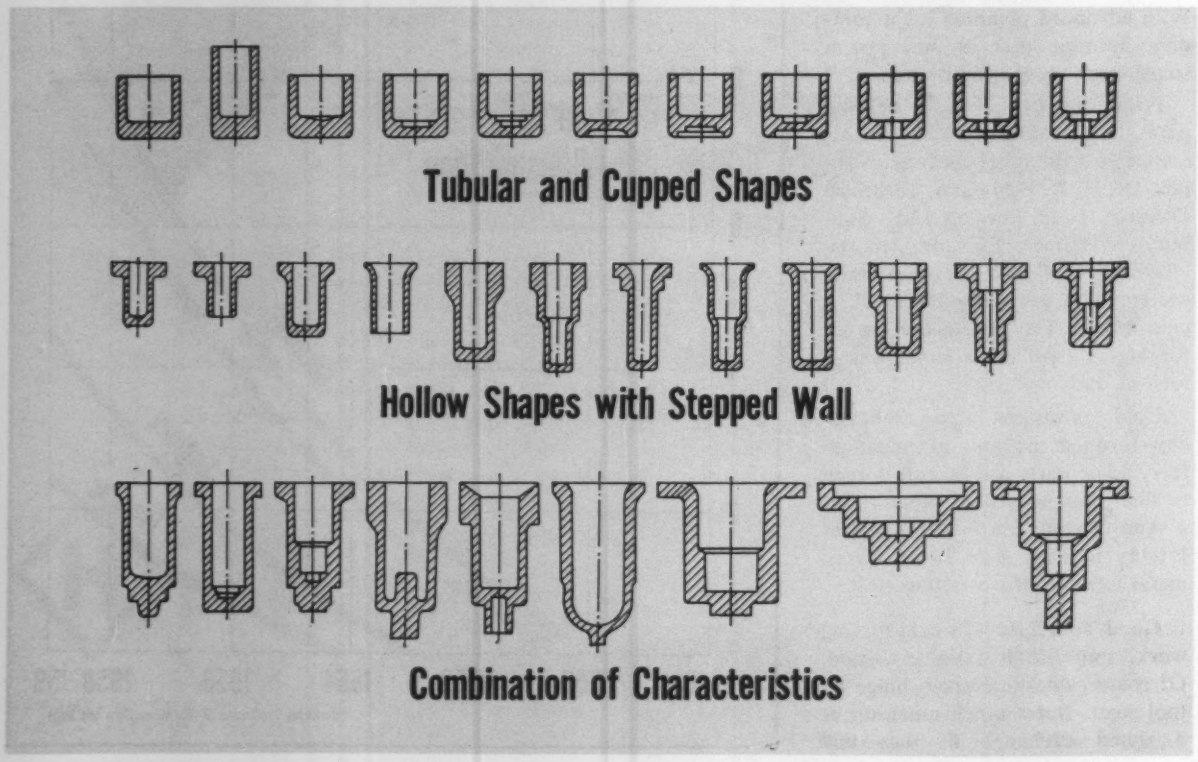
**Degrease and Pickle** — Each blank receives a thorough surface treatment. It's degreased, pickled and phosphated. Sometimes other lubricants are used along with the phosphate layer. All surface-treating work can be automated.

One automated surface-treatment installation uses a central rise-and-fall turntable. This turntable dips suspended baskets of cropped slugs into the pickling baths.

Oscillation of the baskets insures that each slug's surface area receives uniform treatment from the various fluids. A fixed cycle controls the basket movements from bath to bath. Thermostats maintain optimum dipping temperatures.

**Complete Lubrication** — Dropping down a discharge chute, the

## Hollow Shafts Are Cold Forged to Shape



surface-treated slugs enter a screw conveyor. This conveyor carries the slugs through a lubricant. Thus they become coated on all sides.

For some jobs, it's best to separate the cropping and the preforming operations. For fairly simple shapes, you can combine these preliminary-work stages.

Hydraulically-operated preform machines turn out 1200-2400 parts per hour. Each machine is a completely self-contained unit. With transfer devices, these units adapt themselves to automated lines.

Floor space requirements are modest. Each preform machine takes up 24 x 48 in. on the shop floor. Weighing about a ton, the preform machine is 48 in. high.

**Burr Free**—To prevent cropping burrs from being folded into the parts during cold forging, all slugs undergo deburring and chamfering. The chamfer helps the slugs to enter the dies. It also increases die life by preventing out-of-line forge blows.

The final link is the cold-forging machine itself. This machine must be extremely rigid. Large cast-steel sections, held together by heavy prestressed tie bars reduce distortion to levels far below those normally encountered in heavy machinery.

A variable-speed motor transmits power to the forging ram. This ram slides in long guides. By distributing the load over several planetary gears, the cold-forging machine keeps noise down, even as it forges complex shapes at 90 stroke-per-minute rates.

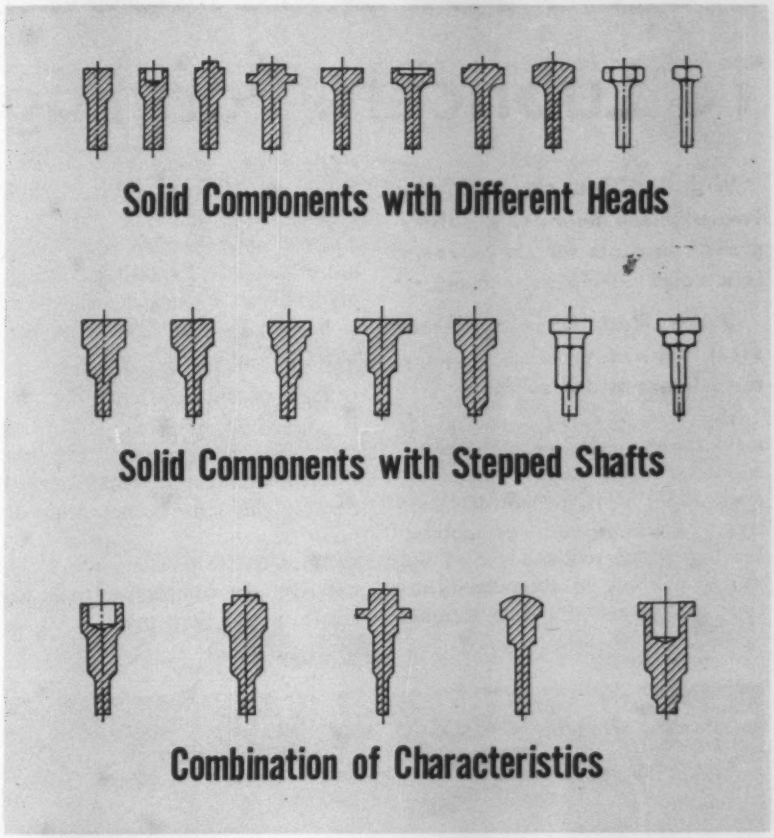
A cam controls the cold-forging machine's ejector system. Fully-automatic lubrication reduces maintenance problems. In addition, the machine has a pneumatically-operated clutch and brake system.

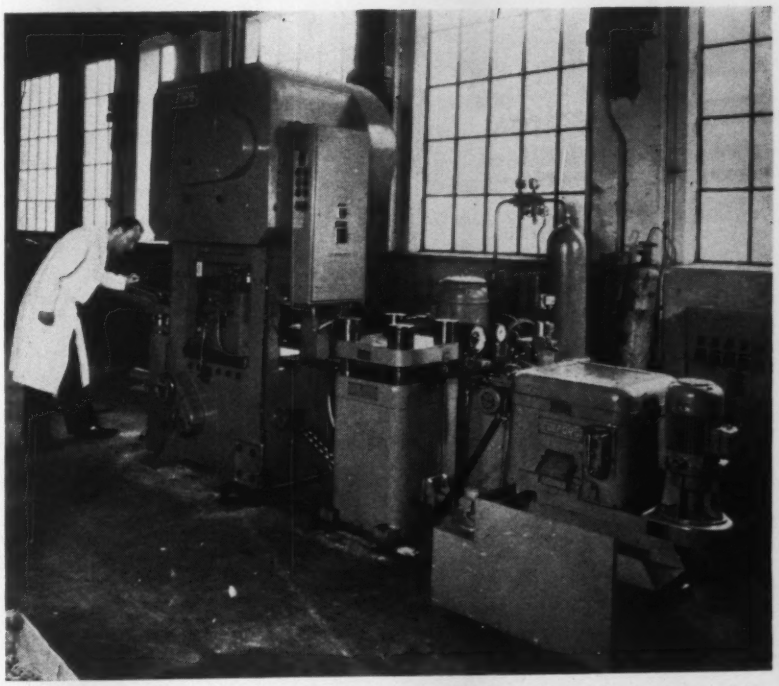
---

**Reprints** of this article are available as long as the supply lasts. Write Reader Service, The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Ask for Reprint **No. 183**

## Note Solid-Form Extrusions



**COLD-FORGING PRESS:** To reduce noise level, British-made machine distributes cold-forging load over a series of planetary-type gears.

# New Tool Steel Uses Tungsten To Lubricate Forming Punch

**With 0.0001-in. clearance between punch holders, a rotary press compacts ferrite powders into computer-memory cores.**

**Under load, these tungsten-steel holders yield a slippery abrasive-resistant surface.**

■ Powdered metals are finding more and more uses. One of the latest applications for ferrite powders centers on electronic computers. Powdered iron oxides serve as the magnetic cores in computer-memory systems at the International Business Machines Corp., Poughkeepsie, N. Y.

Each of these tiny cores has a hole diameter of 0.030 in. Weighing less than 1.3 mg, the transformer-like core is 0.012 in. thick with an 0.050-in. OD.

**Tight Tolerances**—After a core is pressed out, it's sintered to withstand punishing action. Size control is a vital factor. Final sintered-core weights must be held to ±0.1 mg.

Since ferrite powders are highly abrasive, the compacting tools can create production snags. As the press revolves, some of the abrasive powder flies into the platens. Then it works its way between the punch holders' shafts and bearings.

Check Typical Analysis

| Element | Pct | Element | Pct |
|---|---|---|---|
| C | 1.50 | Cr | 0.90 |
| Mg | 2.00 | Mo | 1.00 |
| Si | 0.25 | W | 4.00 |

A new tungsten tool-and-die steel yields up to twelve times the service life formerly obtained with high-carbon high-chrome punch holders. This newcomer is called Hi Wear 64, a product of The Carpenter Steel Co., Reading, Pa.

**Proof of Pudding**—Some holders made from the new wear-resistant steel have been tested for cold-work applications at the IBM plant. After a year of service, these test holders show no signs of wear. One four-month production run on a rotary press proves out the tungsten tool steel's superior wear resistance.

Carbon-steel holders last from 4-6 weeks. Then they have to be scrapped due to abrasive wear on the head and side of each shaft.

Often, the carbon-steel holders become so loose that they can't maintain tight tolerances. Galling and seizing are other common problems. In some cases, the "frozen" tools break.

**Eight for One** — When punch holders are made from the high-carbon steel, only one tool can be used on a single press. With the wear problem a thing of the past, IBM operates eight punches in every press. Thus output is up 800 pct per machine. As a direct result, overall production costs have tumbled.

The company turned to Hi Wear

**HIGHLY ABRASIVE:** Gravity-feed hopper deposits abrasive ferrite powder into compacting punches. New punch holders boost output 800 pct.

64 because it boasts handling ease and good dimensional stability in heat treat. Each tool is precisely turned, milled, drilled, heat treated and ground before it enters a press.

A diamond wheel jig-grinds a hole in each of the punches to ±0.0001-in. concentricity, with regard to the outside diameter. Due to the steel's extreme wear resistance, all grinding must proceed very slowly and carefully.

**Precision Grinding**—The outer surfaces on every punch combination are ground with a 120-grit silicon-carbide wheel. Using a maximum infeed of 0.0005 in., the wheel removes 0.010-0.015 in. of metal.

Both the upper- and lower-punch holders are made from 1⅛-in. bar stock. The bottom surface of the lower holder acts as a spindle. It's slightly lubricated for easy movement on the circular-press track. The top spindle's head and upper shaft also receive a small amount of lubrication.

In service, the steel spindles develop a slippery surface. This is normal behavior with high-tungsten steels. The ability of the tools to work with little or no lubrication is of prime importance.

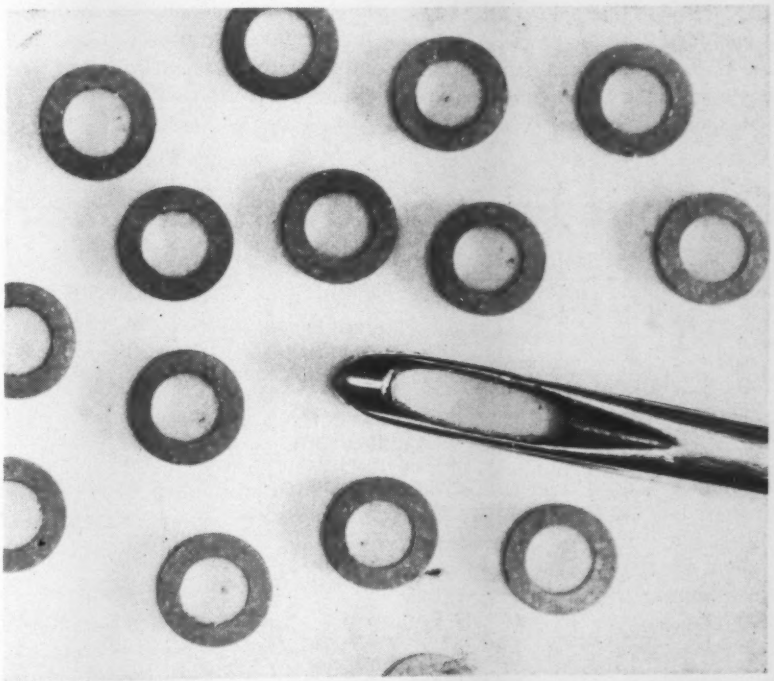
**Keep Them Dry**—Excessive lubrication is as welcome as the plague. All of the memory cores must remain dry at all times.

Hi Wear 64 is a deep-hardening steel. It combines the simplicity of a low hardening temperature with good wear resistance and dimensional stability. The low hardening temperature means that the steel doesn't tend to decarburize. It machines as easily as high-carbon high-chrome analyses.

Tools made from the new steel can be hardened in oil or air. In general, the choice of a hardening medium depends on a tool's mass. There's no danger of distortion or cracking with either medium.

If the smallest dimension on a tool is in excess of one inch, oil hardening is recommended. It produces a maximum hardness of 64-65 Rc, after tempering at 350°F.

**CAM ACTION:** As the press completes a revolution, its upper cam actuates eight separate punches made from a 4.0 pct tungsten tool steel.



**DATA STORAGE:** A needle's eye shows the size of some magnetic cores formed from the abrasive powders. Up to a million of these tiny cores are used in the memory system of a single data-processing machine.

# Reclaimable Composite Molds Automate Casting Lines

**New foundry developments insure precision-casting results at mass-production costs.**

**Twin springboards to truly-automatic casting center on a reclaimable low-cost mold and a high-speed bakeout process.**

■ A new composite mold opens the door to automated moldmaking and straight-line production casting. The newcomer is a reclaimable ceramic-faced sand mold. It turns out top-quality castings at costs which challenge the crudest foundry methods.

Recently unveiled by the Shaw Process Div., Avnet Electronics Corp., Port Washington, N. Y., the composite mold has no size limit.

**Fast Bakeouts**—Working hand in glove with the new mold is a streamlined bakeout process. Bakeout time has tumbled from about five hours to a few minutes. With high-speed bakeouts, costly and cumbersome ovens aren't needed.

The new mold consists of a main body of chamotte-type sand. This low-cost sand forms about 95 pct of each mold by volume. It's faced with a special ceramic slurry.

However, this mold structure accounts for only part of the major cost savings. A second cost factor centers on reclamation. After the mold is broken to free the metal casting, all of the sand backing and most of the ceramic facing can be reclaimed.

**No Burn-In**—Sand blasting removes the few small pieces of facing which cling to the metal. Since the ceramic mold's interface doesn't permit "burn-in" of the molten metal, reclamation is almost 100 pct complete.

To make a composite mold, a final pattern and an oversized-preform pattern are needed. Cope and drag preforms must be 3/32-in. oversize on all surfaces. This allows space for the ceramic facing.

Next, you've got to grind both the tops and bottoms of the cope and drag flasks. Even the flask ears must be Blanchard-ground.

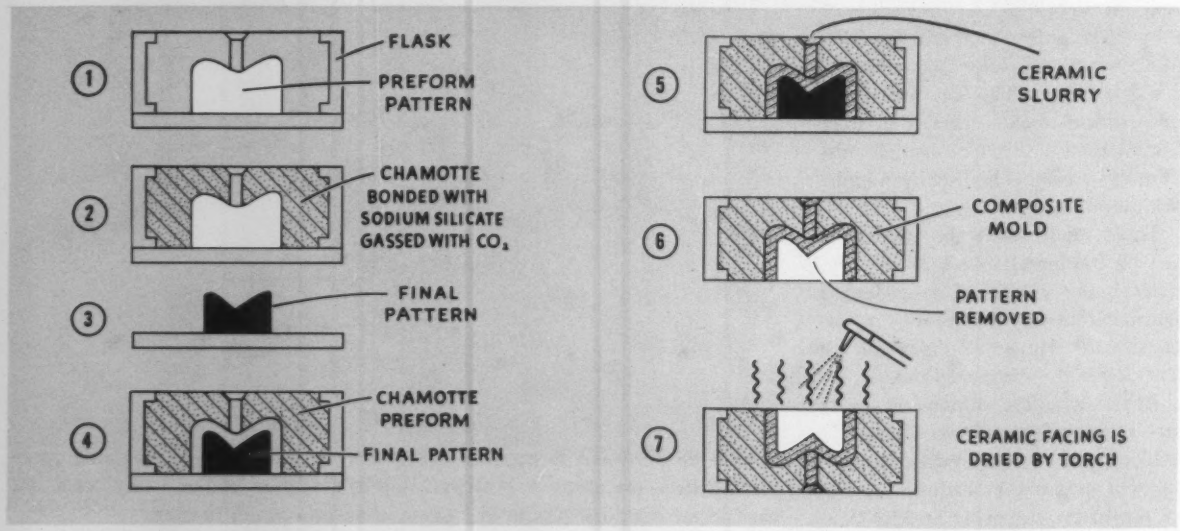
**Manual Alignment**—For perfect alignment at each stage, drill and ream all alignment holes to match a jig. As a further safeguard, you should cast a sand strip on the inside of the flesks. This strip keeps the hardened preforms from shifting during handling.

As the preform patterns are mounted on a pin-lift molding table, dowel pins align the flasks. Then quick-acting clamps secure all patterns to the table.

A backup mix, made from sodium silicate and reclaimed chamotte is poured over one of the preforms. The next step in making a composite mold is to gas the preforms.

**Gas Harden**—First, a bell jar is placed over one of the flasks. All air is evacuated; then carbon dioxide is pumped into the preform.

## Ceramic Facing Covers Chamotte-Sand Core



While gassing the first preform, the operator rams up the second flask.

By the time the second flask is rammed, the first preform has gas-hardened. The operator transfers the bell jar to the second flask where he repeats the gassing cycle.

Next, he strips the first preform and removes it from its pattern. After gassing, the second preform is also stripped and removed. Both hardened preforms are then aligned with the final pattern.

The operator is now ready to face the mold with the Shaw ceramic slurry. This slurry consists of a formula of refractory powders, an ethyl silicate-based binder and a gelling agent.

**Mechanical Bond**—As the thick slurry is poured between the final pattern and the hardened backing, it penetrates the interstices of the porous backing. Thus it creates a strong physically-interlocked mechanical bond.

Gelling occurs within three minutes. After the ceramic facing hardens, the composite cope and drag are unclamped. They're lifted off the patterns by a foot-operated stripping plate.

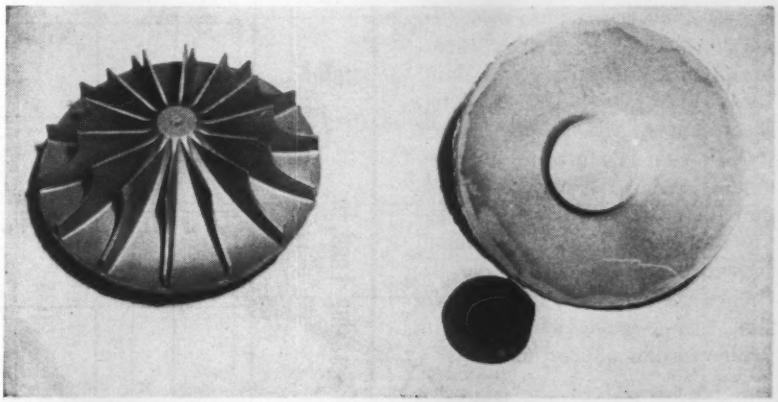
Although these operations are performed on a manual bench-molding basis, the entire process can be automated. Shaw Process engineers have developed an automatic molding machine which yields 120 molds per hour.

**Complete Automation** — In essence, the automatic moldmaker is a 24-station indexing unit. Key stations include: A core shooter and gasser for making preforms; a transfer that places the preforms on the final patterns; an automatic slurry-mixing injector; and a mold stripper.

Since each indexing unit is fully automatic, one man can handle a battery of these machines.

After the composite molds are stripped from the patterns, they're placed on a roller conveyor. This conveyor runs through a torching zone where all volatiles are ignited and consumed. During this burn-off period, each mold gains a microscopic network of cracks throughout its surface.

**FIVE-MINUTE BAKEOUT:** High-pressure torching burns off all volatiles. Microscopic cracks in each mold, caused by the rapid bakeout, help to free finished castings. Mold reclamation is almost 100 pct complete.



**AS-CAST PART:** Note detail on aircraft supercharger's thin vanes.

**Air Blasts Sand**—Cope and drag molds move directly into the high-pressure torching zone. Here, they're quickly heated to incandescence. Only the thin-ceramic layers must be dried out. This is done in a single high-pressure step which never lasts more than five minutes.

Now, let's follow the finished molds into an automated-casting line. Metal pours down each riser. After the hot metal cools, the risers are hit with an air hammer. This shakes out the backing sand.

The only material left clinging to each casting is some of the ceramic facing. Sand blasting easily removes all the excess ceramic.

# Adhesive Bonding of Metals: What Are Design Factors?

**More and more manufacturers are looking into adhesives for the bonding of metals.**

**But first, there are a number of design factors to consider for effective joining.**

■ That adhesives are becoming more and more popular for joining metals is borne out by their growing use in automobiles and aircraft. And their use can be expected to expand into other metal bonding applications.

There are a number of potential advantages to adhesive bonding. Included are: Ability to join dissimilar metals; low cost; clean surfaces.

**Discuss Adhesive Bonding**—On what bases are adhesives chosen? What are their limitations? These and other questions were discussed in Detroit by K. F. Charter, director of plastics research, A. O. Smith Corp., Milwaukee. The occasion: The recent ASME meeting.

One vital factor in adhesive bonding, points out Mr. Charter, is joint design. Joints must be properly designed to obtain maximum strength properties.

Take the lap joint, for example. This easy-to-make joint is quite common in manufacturing items.

**Stresses Concentrate**—However, subjecting a lap joint to shear stresses results in higher stresses in the adhesive at each end of the overlap. Peeling stresses, combined with the effects of differential straining, greatly reduce the strength of lap joints.

Thus, the observed failure loads on metals which can deform in this way are much below the true strength of the adhesive.

The problem is that the center of the lap joint contributes very little to joint strength. Consider the example of a 1-in. lap joint bonded by adhesive. Bond strength is 3000 psi.

If the lap joint is bonded instead with just two ¼-in. bands of adhesive, joint strength is 2500 psi—just 500 psi less than the entire 1-in. adhesive bond. Thus, the center half of the lap contributes only about 1/6 of the total strength.

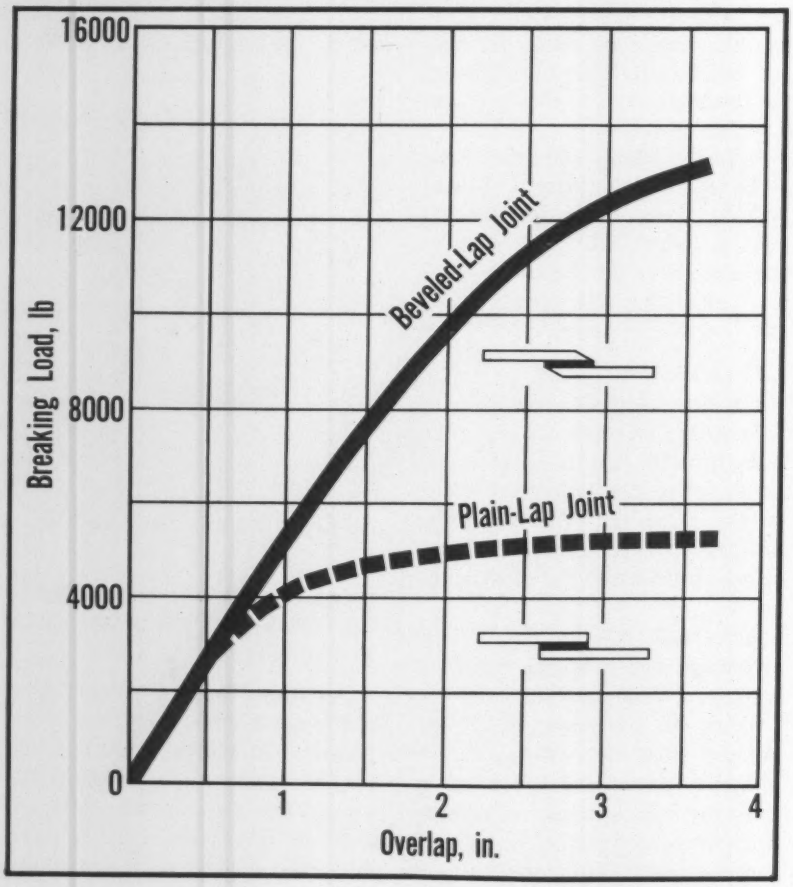
**Strength vs. Overlap**—The first chart indicates that the apparent bond strength is not directly proportional to the length of overlap. Each adhesive forms a different curve. But the general traits are alike.

The strength of a lap joint also depends on the thickness of metal (note the third chart) and the yield strength of the metal, adds K. F. Charter.

What other factors enter into lap-joint design? For one, The Martin Co. finds that, for aluminum alloys, optimum overlap length is about twenty-five times the metal thickness for a particular adhesive.

It's also been determined that

## Joint Design Affects Strength



# Should a Bonded Joint Be Used?

**Pros**

1. Load is equally distributed; smooth contours.
2. Elastic enough to absorb certain stresses.
3. Can join dissimilar metals.
4. Bonded joints dampen vibrations.
5. Cuts fabrication costs.
6. Can bond large areas quickly.
7. Effect reduction in weight.
8. Bond minimizes galvanic corrosion.
9. Does not embrittle or warp metals.
10. Eliminates need for high temperatures.
11. Leave good surfaces for organic coatings.
12. Provide sealing action.
13. Give easy alignment of joined parts.

**Cons**

1. Heat and pressure may be needed for curing.
2. Jigs and fixtures may be costly.
3. Some adhesives are susceptible to high humidities and/or low temperatures during application.
4. Scant background data in durability and permanence tests.
5. Not as stable as metals at high temperatures.
6. Surfaces to be bonded must be very clean.
7. Parts to be bonded must be closely mated.
8. Time to form a bond may add unreasonable cost.
9. Inspection and nondestructive testing are difficult.
10. Other joining methods may be stronger.

the strength of a lap-shear joint is directly proportional to joint width.

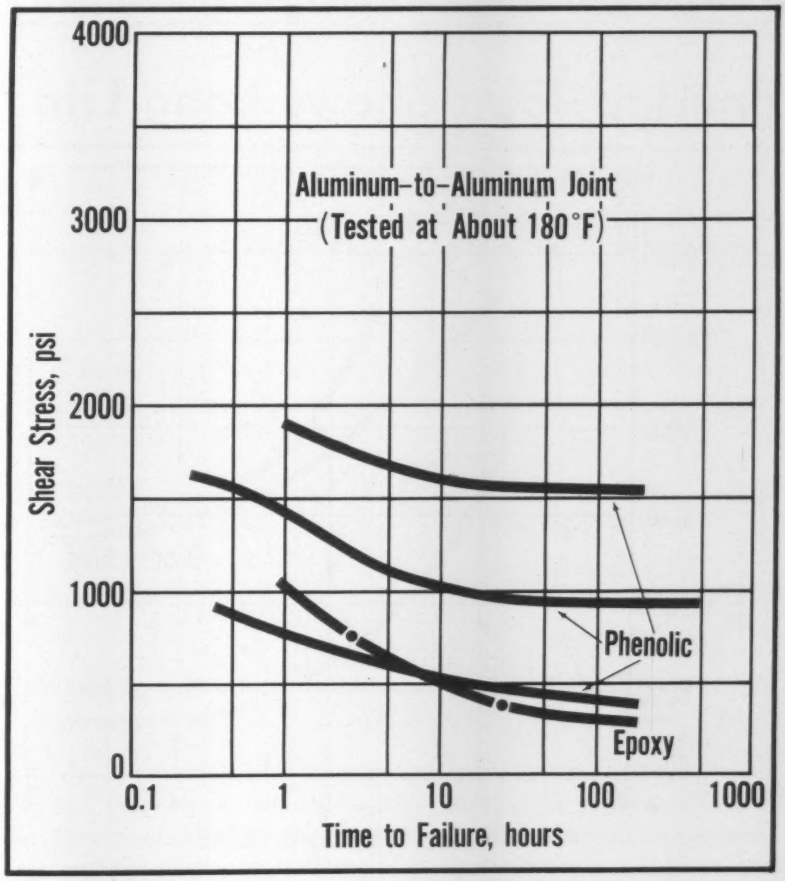
**Choose Joint Type**—There are a variety of other joints. One, the beveled joint shown in the first chart, is one of the most efficient; it lessens the concentration of stresses at the ends of the overlap. In production, however, the beveled joint is costly and is therefore not recommended.

Peel stresses must be kept to a minimum for properly designed adhesive bonded joints, points out Mr. Charter.

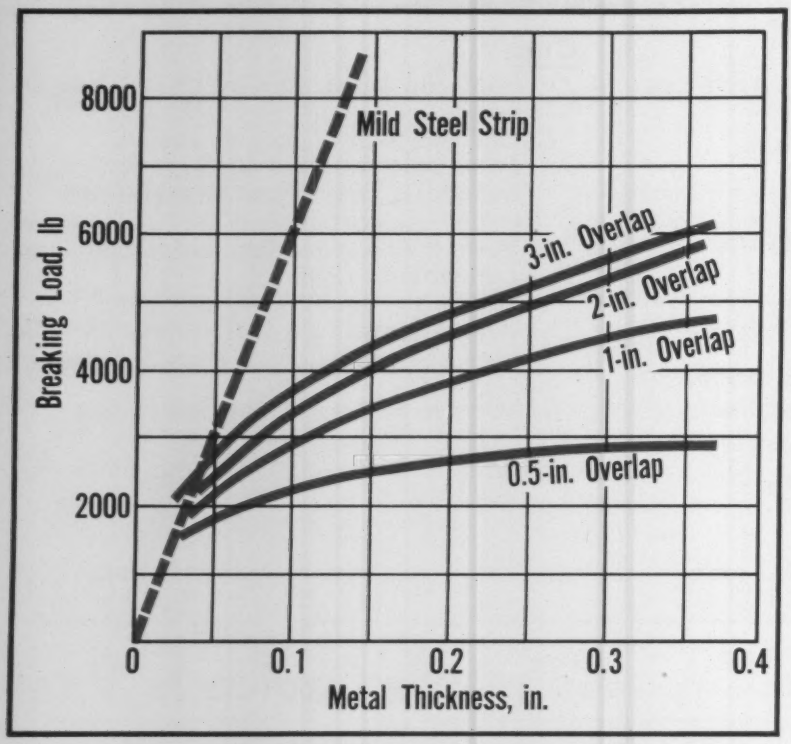
"It's most desirable to bond the parts so that the adhesive is stressed in shear. In heavy sections, a bond that is placed in pure tension should be satisfactory. However, cleavage stresses usually result which reduce the strength of the joint.

**Not Too Much Glue** — The strength of a lap-shear joint also depends upon the thickness of the glue line. According to G. W. Koehn of the Armstrong Cork Co. an optimum glue-line thickness exists. It appears to be about 4-6

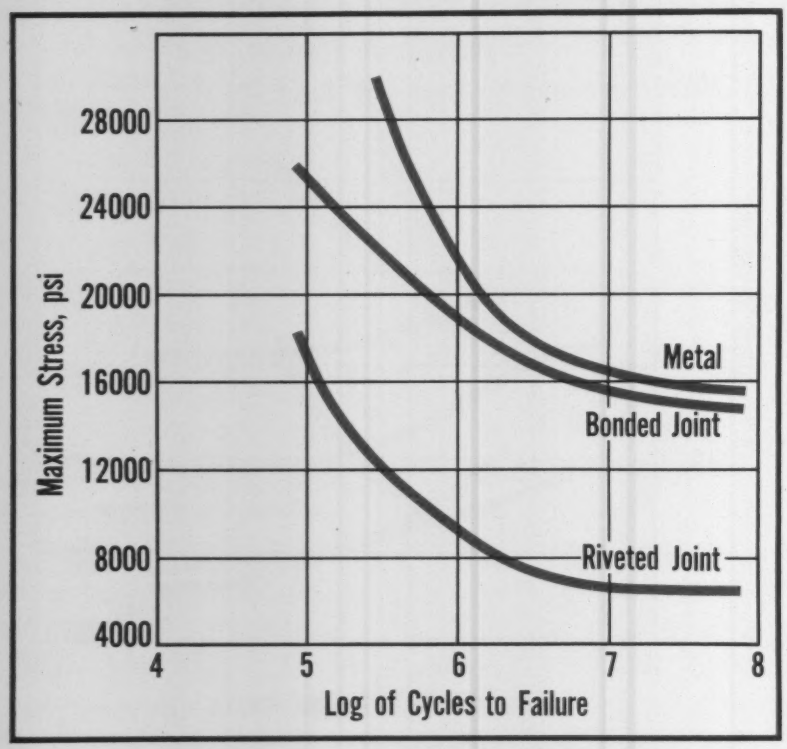
## Adhesive Choice Is Vital



## Metal Thickness Is Factor




## Bonded Joint Shows Long Life




mils but varies with the adhesive used.

How about fatigue strength? It's been found that fatigue strengths at −65 to −70° are almost equal to those at room temperature. Also, most of the failures at the low stress levels were in the metal rather than in the adhesive bond.

The fourth chart compares the fatigue strength of a bonded joint with that of a riveted joint. It shows that the bonded joint is almost as strong as the base metal.

**Compare With Rivets**—"The improvement of bonded structures over riveted structures in fatigue in aircraft is a major advantage of bonded joints," says Mr. Charter.

One test concerned a test panel for B-36 bombers. The number of cycles to failure were: Spot welding, 12 x $10^6$ cycles; riveting, 18 x $10^6$ cycles; adhesives bonding, 27 x $10^7$ cycles. The failures of the spot-welded and riveted sections were due to stress concentrations developing at the weld or rivet holes.

The second chart shows the effect of long time loads or stresses on lap-shear joints. Even at 180°F, some adhesive-bonded joints withstand high stresses for long periods of time.

How durable and permanent are adhesive bonds?

**Hold Up in Service** — "Bond strength determined shortly after a bond has been formed is not an indication as to what the strength will be after aging or exposure to various environments," explains K. F. Charter.

Thus, a number of weathering tests are made. For example, painted steel-to-steel bonded specimens were exposed on A. O. Smith's factory roof in Milwaukee for over five years. Result: Little change in strength.

One military specification requires adhesive bonds to withstand salt spray exposure, immersion in water, ethylene glycol, anti-icing fluids, oils, and various fuels. In general, many adhesives meet these requirements.

# Shaver Skins Rod Quickly

**High quality wire products start with clean, fault-free rod.**

**Here's a unit designed to shave surface defects from the rod at fast thrufeeds.**

■ Today's demand for high quality alloy wire requires mills to remove surface defects from rod stock prior to finish drawing. Methods already in use include pickling, shot blasting and planetary grinding. Calow & Co., Bielefeld, Germany, offers another skin removal method—that of shaving the rod.

The shaving method has three major benefits — it permits chip reclamation, increase thrufeeds, and automates reel loading and threading.

**Adjust Easily** — The machine's multiple cutter heads turn at 8000 rpm. It has thrufeed rates up to 130 fpm on ¼ in. diam rod. The solid carbide shaving knives take bites from as little as a few thousandths to over 1/16 in.

The unit can be set up to readjust the diameter setting of the knives by means of a hand wheel during the operation. This would compensate for tool wear.

Plans have been made to combine this feature with an automatic backfeed diameter adjustment. Thus a gage can read the finished rod size continuously. If the diameter exceeds the maximum tolerance, the unit will adjust the cutter head automatically. This size-control system is particularly useful for long coils.

Should one or more shavers chip during the cycle, the knives can be replaced without cutting the wire.

**How Shaver Works**—Wire feeds vertically into the machine. This eliminates gravitational forces on the shaving head's bearings. The unit has four arm-mounted reels. During the operation, one reel (A) in a pit beneath the machine, pays out coiled wire.

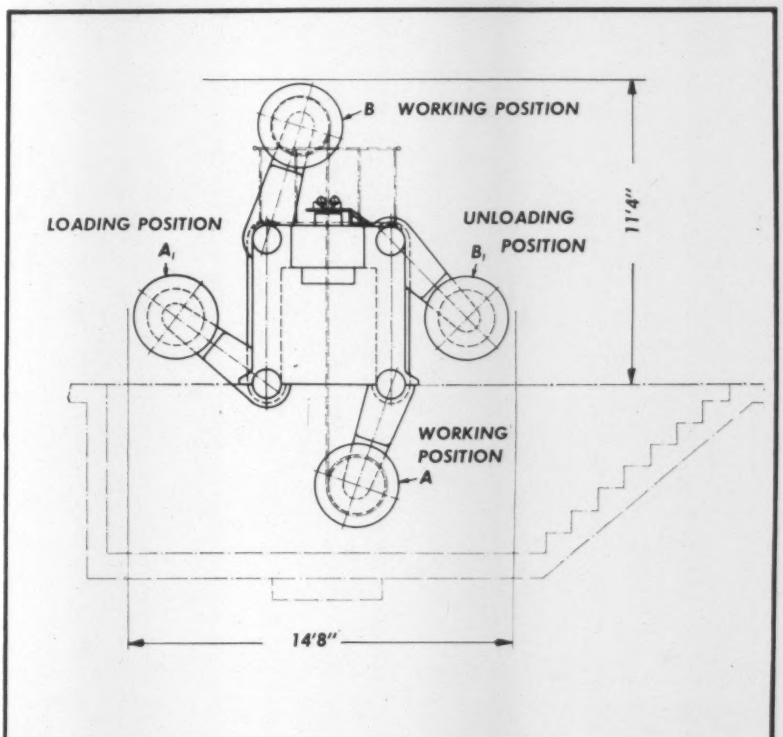
The second (B) reel, located directly above the machine, takes up the shaved wire. The third ($A_1$) sits at floor level, forward of the machine, and is loaded with a reel of fresh rod. The fourth ($B_2$) reel, at the rear of the unit, is unloaded and ready to swing above the machine and accept wire for the next cycle.

Working in sets, reel A feeds to B and reel $A_1$ feeds to $B_1$. When the wire from A reel is expended through the shaver and rewound, the operator pushes a control button advancing the two sets of reels 90°. The next cycle calls for the 90° arc to run in the opposite direction. This ability keeps loaded and take-up reels in position, holds downtime to a minimum.

**Reel Action** — The wire leaves the main machine housing, guided automatically to hit the take-up reel at a predetermined spot. A mechanism positions the take-up reel to offer a fair-sized rectangular opening in its core to the approaching head of the wire.

Upon entering here, the wire locks itself in an automatically-operated eccentric clamp and actuates a switch which starts the take-up reel revolving. Adjustable to the wire diameter, the take-up reel moves back and forth, spooling the wire neatly layer upon layer.

## Reels Worked in Sets Save Time




**MAKING THE TURN:** The wire shaving unit advances its reels 90°. One pair of reels operates in the vertical position while the second set is being loaded and unloaded. This holds downtime to a minimum.

# Near-Standard Specials: A Way To Solve Fastener Problems?

**Before you demand a special fastener, check existing types.**

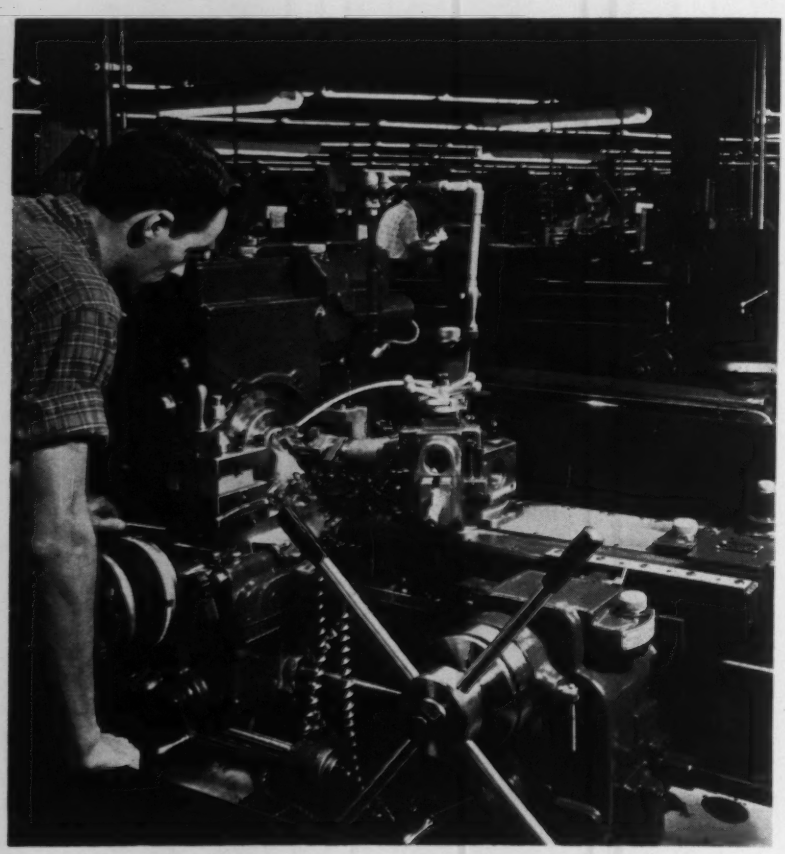
**A slight change on a standard blank or in your spec may do the job, without mushrooming costs.**

▪ Special fasteners by inference suggest a high price tag. Some "specials" have to be more expensive than "standards" because of special processing, handling and other factors. But, are they necessary?

C. A. Hansen, manager of the Specials Div., Standard Pressed Steel Co., Jenkintown, Pa., poses a three-part question to every buyer who feels he must order specials.

**Check Standards** — First, is it really a special you need, or do some manufacturers make it as a standard? Secondly, if it's a special, need it be so—or could a standard be made to do the job just as well? Last of all, if it has to be a special, can it be made economically?

In this latter category, SPS tries to accommodate its customers with what it calls "near-standard specials" or the "standard except." These are specials made from modified standard-fastener blanks, often at little extra cost.



**SMALL CHANGE:** Often a request for a special fastener requires only a minor change in tooling or in the fastener maker's machining setup.

**Business Special** — Hansen reports that specials accounted for a growing percentage of the company's industrial-fastener business last year, despite a rising volume in 2800 standard-catalog items.

Many specials are so regularly in demand today, they verge on being standards. Manufacturers like SPS are set up to handle them almost as speedily and economically as standards.

Purchasing agents often overlook (or are unaware) that these economical specials exist. Thus, they pay more than they should for fasteners that will serve the purpose. Where the specials do cost more, the question of "how much more" depends to a surprising extent on the purchaser.

The purchaser does himself a disservice if his inquiry on the special goes no further than, "Here's what I want! Can you give it to me? How fast? What price?" This leaves the supplier little leeway in educating the buyer on fastener selection, assembly problems, and his own manufacturing capabilities and skills.

**Special Case** — A purchasing agent for an aluminum-extrusion maker phoned the SPS specials group about socket - head cap screws. With 8 threads per inch, they must be 1 in. x 3½ in. long, with a head diameter of 1-7/16 in. In the context of his everyday-fastener requirements, the customer concluded that he needs a special.

Let's apply the self-imposed questionnaire. First, is the request really a special? This may be a simple job of scanning the catalog, or a task for the specialist. The item above turns out to be a special since no standard covers it.

Secondly, does it have to be a special to do the job? Often the

customer may be over-specifying himself into a specials category needlessly. The SPS group can often suggest a close standard. Sometimes, if a minor change in the specs is permissible, a standard may serve just as well.

**Weigh the Need**—The ability of the supplier to suggest time and money-saving alternatives hinges on getting all the facts from the customer. In the case above, the customer needed both an additional bearing surface under the head and a special grip length. A special was the only product to handle his job.

There are, however, countless examples at SPS of how the customer needlessly moves a fastener into the realm of a special. Close specifications on materials or dimensions are cases in point.

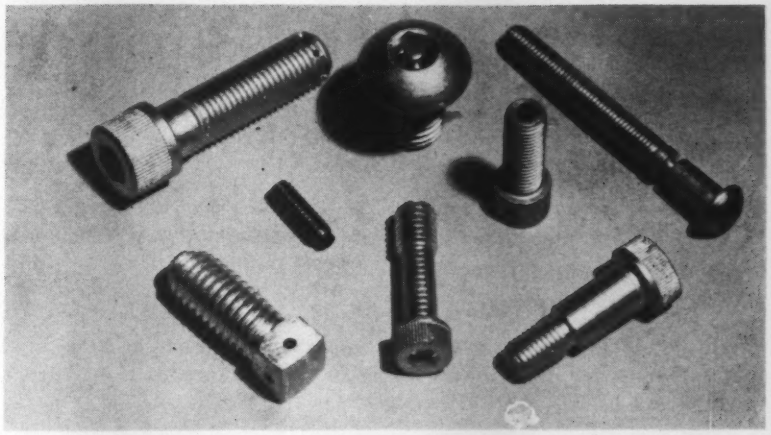
Let's say a customer asks for Type 305 stainless-steel fasteners simply because he's used them before. At the time he places his order, the manufacturer may be making Type 304, which will serve the customer's requirements. By switching from one to the other, and without loss of properties, the customer may save on price.

Specifying, through habit, exact thread lengths that are not really critical, is another example of too-tight a specification.

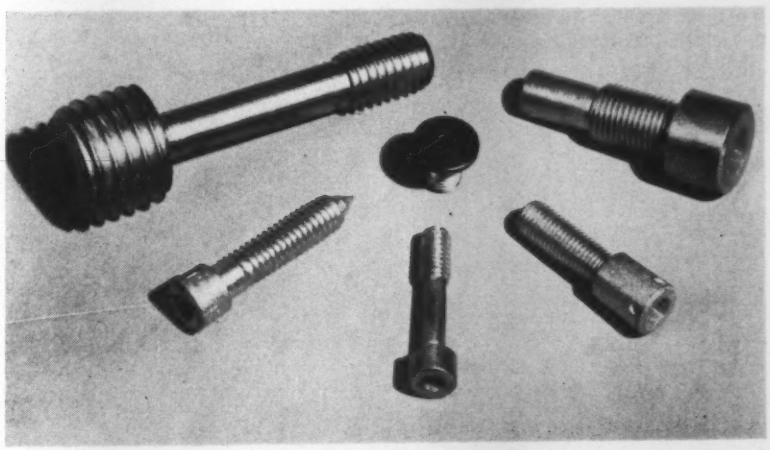
**Near-Standard Special**—Let's assume that even after the first two checks, it still has to be a special. Must it be a costly special? Often it can be made by modifying a standard or a standard blank.

Such a fastener requires little extra trouble in terms of engineering time. As a result, excessive processing changes, extra steps and changes in material can be avoided. A tooling or set-up charge may be the only extra cost involved. In quantity, the fastener may call for a small additional cost premium.

In other cases, a special can't be made by charging a standard or standard blank. If it has to be produced from scratch, extensive engineering, tooling and processing are a must. The complete special is always the most costly fastener.



**NEAR STANDARDS:** Some examples of what Standard Press Steel Co. calls near-standard specials. They can be produced from standard blanks.



**SPECIAL FASTENERS:** For the out-and-out special, the customer should be prepared to pay the special's price. But look for design leeway first.

**Points to Watch**—Where there's doubt as to the best way to solve a fastening problem, a good specials group offers valuable service. They discuss with the purchaser the possible savings that he can effect by certain non-critical changes in his specs.

When the answer still points to the need for a special, there are two things the purchaser can do to obtain optimum value and service. A telephone or letter inquiry can state the problem that must be met. Many such inquiries can be answered immediately.

Of course, the purchaser helps himself by allowing enough lead time. On inquiries, the use of a tabulated blueprint is often a timesaver for both purchaser and supplier.

For example, one large metalworking customer knows it will need a number of different diameters and lengths of the same screw shape over an extended period. Rather than send a number of individual inquiries as the needs arise, this company sent a tabulated print asking quotes on estimated quantities of each screw size.

Price - and - delivery data were listed on tabulated cards, which are ready as the particular size needs arise. In effect, the company cataloged all the specials that will be needed.

# Cleaner Chrome Boon To Melters

## Oxygen-Blown Ferrochrome Reduces Silicon and Carbon

**Higher efficiency, always a forethought of high-alloy steel producers, will stem from oxygen-blown ferrochrome.**

**The cleaner charge chrome offers the melter several other advantages.**

▪ Blowing oxygen into molten chrome, is the key to a product which enables stainless steel and other alloy-steel producers to improve their refining process.

Union Carbide Metals Co., Div. of Union Carbide Corp., claims the oxygen refining innovation represents a successful end to several years of development work by the company. The oxygen treatment of ferrochrome produces a highly-refined charge chrome.

The refined chrome itself is a critical ingredient in the production of stainless steels, tool steels, steel castings, and cast iron. Because of its low residual content of undesirable elements, the ferroalloy suits high-quality airframe and bearing steels.

**Cleans Quickly** — According to UCM, oxidation quickly reduces carbon and silicon. The injected oxygen agitates the molten charge chrome at elevated temperatures. This in turn, serves to homogenize the refined product, giving maximum chemical uniformity.

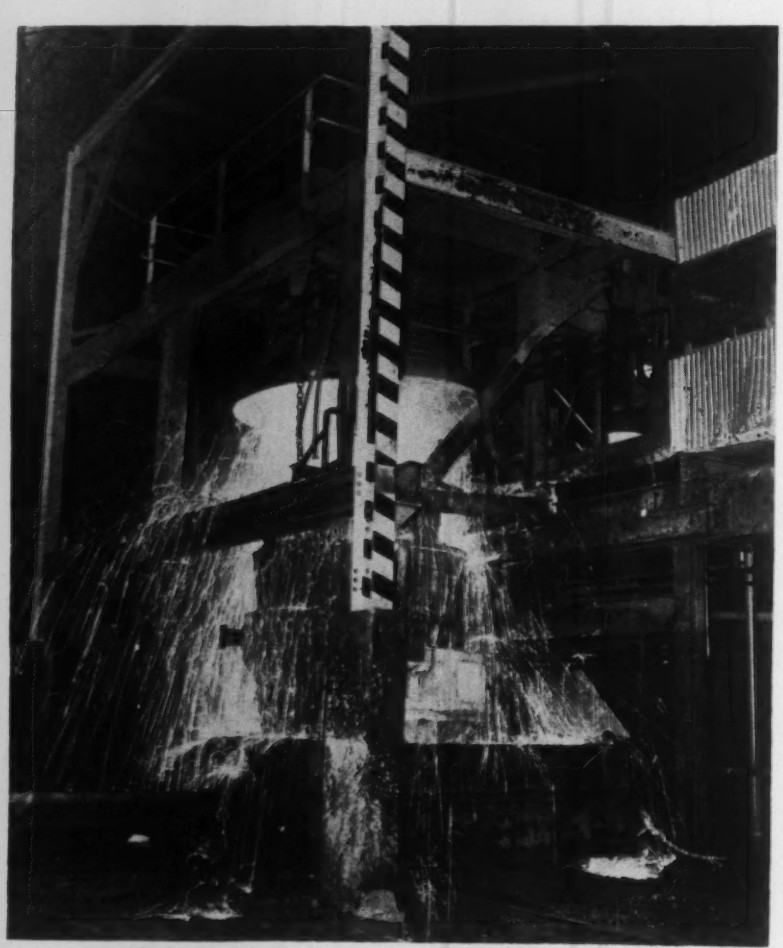
The oxygen blow also raises the temperature of the molten chrome tapped from the submerged-arc furnace. This allows more time for impurities to be removed from the treated fluid alloy.

The oxygen blow removes harmful gases from the melt and produces a solid dense product. Undesirable reactive elements such as titanium are substantially removed from the alloy as the carbon and silicon hit desired levels in the refined alloy.

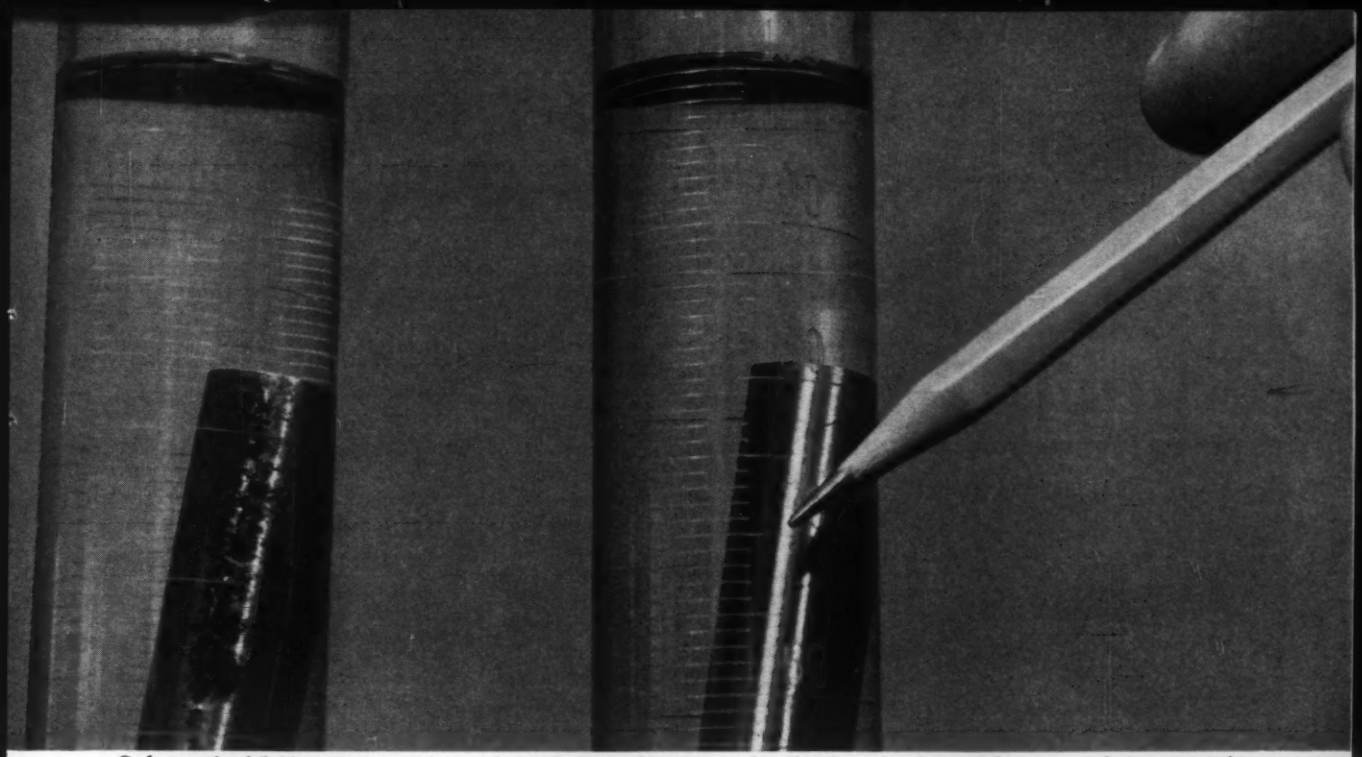
The new refining method produces a ferrochrome containing 58-65 pct Cr; 4.25 pct C max; 1 pct Si max, and 0.03 pct S max.

**Who Wants It?**—Union Carbide anticipates chromium-charge material will interest stainless steel producers; its low carbon and silicon content allow large additions of chromium to the base charge. Melters can add more chromium to the base charge without introducing excessive amounts of carbon and silicon. The latter generate heat during oxidation and cause high bath temperatures.

The lower temperature allows limited carbon content prior to decarburization of the stainless steel bath. The charge-chrome's low silicon level allows the alloy steelmaker to cut the lime addition which was necessary to maintain proper slag basicity in his furnace. The resulting lower slag volume allows a faster heat cycle and a higher chromium recovery.



**CLEANER CHROME:** When oxygen is blown into the ferrochrome charge, carbon and silicon are reduced. Melters, using the end product in their stainless steel making furnaces, find cycles faster, yields improved.



*Carbon steel rod (left) rusts in water after two hours. Rod on right is immersed in Shell Dromus solution. It has not rusted after six months.*

# REPORT:

## Shell reports on ten features of Dromus Oils that can help you reduce cutting time and costs

THE Shell family of Dromus® Oils includes both solution-type and emulsifiable cutting fluids.

Each Dromus product has its own area of application—depending on water hardness, metal characteristics and specific job requirements. However, the entire range of Dromus Oils offers these ten benefits:

**1.** Dromus Oils are concentrates. They are designed to be mixed with the proper quantity of water at point of use for optimum results.

**2.** Dromus Oil emulsions resist foaming even under most severe conditions.

**3.** Dromus Oils contain an effective germicide. Result: less danger of rancidity and bacterial growth.

**4.** Dromus Oils do not separate. Even when mixed into emulsions containing more than 50 parts' water, Dromus Oils maintain their stability.

**5.** Dromus Oils prolong grinding wheel life. They prevent the wheel from "loading up" with metal from the work.

**6.** Dromus Oils provide effective corrosion protection for tool and workpiece. (See photograph above)

**7.** Dromus Oils permit greater dilution than many soluble oils.

**8.** Dromus Oils wash away metal chips with high efficiency. Chips then settle out of the emulsion.

**9.** Dromus Oils can be kept in the machine during plant shutdowns.

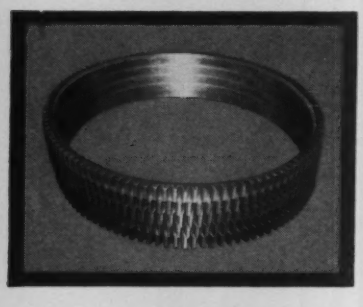
**10.** Dromus Oils are made under strict controls. Manufacture of Shell Dromus Oils is scientifically controlled.

There is a Dromus Oil for your cutting, sawing, boring, threading, milling or grinding need. Call your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, New York.

SHELL

**A BULLETIN FROM SHELL**
**—where 1,997 scientists are working to provide better products for industry.**

# USE RINGS IN YOUR PRODUCT?



## Let Amweld show you how much flash butt-welded rings can cut your costs!

Amweld flash butt-welded rings will curb your ring costs two ways. One, you'll save on metal, because Amweld can form your ring from stock produced to or near finished dimensions. Two, you'll save on machining, because unnecessary metal is left at the mill—not machined away in your shop.

Through close evaluation of circular components and assemblies and close-tolerance fabrication of rings, Amweld saved its customers more than one million dollars last year alone. Savings were recorded by manufacturers in almost every industry—construction equipment, motors and generators, fabricated metal plate work, mechanical power transmission, transportation and materials handling, also jet engines and missiles where Amweld's ability to flash weld exotic materials to exacting specifications offers proof of Amweld quality.

Investigate now! To see how Amweld saved Gar Wood 19% and 26% on rings for truck-mounted cranes, send coupon for your free copy of Amweld Application Study C-1. Then let your Amweld representative show you how much flash butt-welded rings can cut your costs on any part that's round!

AMWELD®
INDUSTRIAL PRODUCTS

**The American Welding & Manufacturing Co.**
**704 Dietz Road, Warren, Ohio**



Yes, send Gar Wood Application Study along with full details on Amweld flash butt-welded rings as a cost reduction opportunity.

Name & Title_____

Company_____

Address_____

City_____

State_____

*Amweld sliced 19% off the rough ring cost of the 50"-diameter, 1020 carbon-steel gear used in the Gar Wood crane's rotating table. Savings on rings of 23" and 28" in diameter totaled 26%. Mail coupon today for the complete Amweld savings story.*

# New Catalogues And Bulletins

**Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.**

## Protects Metal

In four pages, a new bulletin gives all the details on a medium-priced, corrosion-resistant plastic coating for metal. According to the folder, the sprayable coating is soluble in water. It's used as an exterior coating to protect against acid spillage, or as an interior-product contact coating for protection against corrosive attack by most acids. (Pfaudler Permutit Inc.)

For free copy circle No. 1 on postcard

## Pipe-System Welding

Practical information on techniques and costs related to cross-country transmission and pressure piping systems are given in a technical bulletin. It's primarily concerned with the economics of welding and the performance of the welds. (The Lincoln Electric Co.)

For free copy circle No. 2 on postcard

## Plastic Molding

An 8-page brochure outlines the comparative merits of automatic versus semi-automatic molding of thermosetting materials. In the process, it clarifies some popular misconceptions about the automatic processes. The main body of the data book deals with various models of a new compression-molding line. (Dake Corp.)

For free copy circle No. 3 on postcard

## Bulk-Weighing Systems

Sequence drawings graphically illustrate the operation of bulk-weighing systems in a colorful brochure. The literature also sets forth capacities, space requirements and the advantages of the systems. (Toledo Scale Corp.)

For free copy circle No. 4 on postcard

## Foundry Information

Featured in the current edition of a company's periodic magazine is the first article in a series dealing with the causes of common casting defects and their practical remedies. It explains porosity, subsurface defects and steam reaction. (Foseco, Inc.)

For free copy circle No. 5 on postcard

## Charge It Up

"Automatic Battery Chargers," an 11 x 24-in. 3-fold data sheet, covers a complete line of automatic chargers for electric-truck batteries. Eighty-three models are listed. (Motor Generator Corp.)

For free copy circle No. 6 on postcard

## Hydraulic Gear Pumps

All the dope on three series of hydraulic gear pumps is contained in looseleaf data sheets. Performance curves, complete data tables and accurate dimensional drawings aid the designer in selecting the unit tailored to his needs. (Wooster Div., Borg-Warner Corp.)

For free copy circle No. 7 on postcard

## Nylon Belting

This new booklet tells all about a flexible nylon-polymer-core belting. It features graphs to determine the proper type of belt, as well as charts for belt width and tension. (Extremultus, Inc.)

For free copy circle No. 8 on postcard

## Thread-Cutting Screws

Three new thread-cutting screws are the subject of an illustrated bulletin. The new literature gives complete information on design, sizes, material applications, recommended hole sizes, drill sizes and



Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 6/15/61

**Circle numbers for Free Technical Literature, Design Digest, or New Equipment:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |

**If you want more details on products advertised in this issue fill in below:**

Page .....Product .....

Page .....Product .....

Page .....Product .....

**INVALID WITHOUT COMPANY NAME AND TITLE**
**PLEASE TYPE OR PRINT**

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

**BUSINESS REPLY MAIL**
*No postage necessary if mailed in the United States*

POSTAGE WILL BE PAID BY

**THE IRON AGE**
Post Office Box 77, Village Station
NEW YORK 14, N. Y.

FIRST CLASS
PERMIT No. 36
NEW YORK, N. Y.

**BUSINESS REPLY MAIL**

*No postage necessary if mailed in the United States*

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77, Village Station

NEW YORK 14, N. Y.

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. **6/15/61**

**Circle numbers for Free Technical Literature, Design Digest, or New Equipment:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |

**If you want more details on products advertised in this issue fill in below:**

Page ..... Product .....

Page ..... Product .....

Page ..... Product .....

**INVALID WITHOUT COMPANY NAME AND TITLE**
**PLEASE TYPE OR PRINT**

Name .....

Title .....

Product Manufactured .....

Company .....

Co. Address .....

.....

City ..... Zone .... State .....

# FREE LITERATURE

minimum penetration in blind holes. In addition, two pages are devoted to a simple test that compares thread-cutting screws. (Parker-Kalon)

**For free copy circle No. 9 on postcard**

## Granite Surface Plates

A 4-page offering describes a special line of oversize granite surface plates. The plates are used in the precision measurement of large parts and assemblies. They give an accurate and extensive reference surface. (The Herman Stone Co.)

**For free copy circle No. 10 on postcard**

## Automatic Handling

New environments of the space age create unique remote-handling problems. All the data on a line of remotely-controlled handling equipment, designed to solve these problems, are available in a 24-page booklet. (General Mills, Inc.)

**For free copy circle No. 11 on postcard**

## Re-surfaces Rollers

Data on a completely-automatic machine designed for hard-metal resurfacing of tractor, crane or shovel rollers, idlers and wheels are contained in a new bulletin. The machine handles items up to 40 in. in diameter. (Automatic Welding Co.)

**For free copy circle No. 12 on postcard**

## Compact Punch Presses

A 2-color data sheet pinpoints the advantages of a line of small punch presses. There are 3- and 5-ton, single-stroke models with a variety of interchangeable components. Instant stroke changes from ¼-2 in. are possible. (Kenco Mfg. Co.)

**For free copy circle No. 13 on postcard**

## Titanium-Mesh Anodes

Basic anode sizes and shapes, plus the available types of anode hooks, are given in an illustrated booklet. It covers a new insoluble anode for platinum electroplating and corrosion protection applications. (Sel-Rex Corp.)

**For free copy circle No. 14 on postcard**

## A Company's Growth

Tracing the growth the American Steel Foundries has achieved through its diversification program, a new booklet is also valuable as background information. It describes the company's varied product lines.

**For free copy circle No. 15 on postcard**

## Arc Welding at Work

Interesting photographs and articles on welding all over the country come in a 24-page booklet. Many of the articles feature time- and money-saving applications. (Hobart Brothers Co.)

**For free copy circle No. 16 on postcard**

## Machinery Mounts

Describing a complete line of machinery mounts, a 4-page catalog illustrates each type and lists the sizes and capacities available. One section is devoted to the results of tests made to show the outstanding physical properties of the mounting material. (Clark-Cutler-McDermott Co.)

**For free copy circle No. 17 on postcard**

## Inorganic Zinc Coating

Written in clear understandable terms, a new bulletin describes the galvanic principle of inorganic zinc protection. It shold be helpful to engineers, design personnel and other individuals interested in protection against corrosion and rust. (Carboline Co.)

**For free copy circle No. 18 on postcard**

## Modern-Design Aid

Intended primarily for fabricators, designers and architects, a 20-page handbook discusses surface-rolled patterns available in stainless, carbon and coated steel. It suggests applications in the automotive, architectural, appliance and business-equipment fields. (Sharon Steel Corp.)

**For free copy circle No. 19 on postcard**

## Automatic Welding

"Engineered Equipment for Automatic Welding" is the title of a 28-page catalog. It has illustrations, charts and specifications covering most phases of automatic welding. (The Webb Corp.)

**For free copy circle No. 20 on postcard**

## Plating Process

An 8-page, illustrated booklet passes on information about a new method for electroplating localized areas of a workpiece. This new process eliminates the plating bath and along with it, the immersion tank. (Sifco Metachemical, Inc.)

**For free copy circle No. 21 on postcard**

## NEW PATENTS

### Aluminum-Killed Steel

**Method of making aluminum-killed steel, W. E. Knapp and W. T. Bolkcom (assigned to American Metallurgical Products Co.), Apr. 18, 1961.** An additive alloy imparts cold and hot ductility to steel without the problem of alumina segregation. It consists of 80-90 pct Al and the remainder rare-earth metals. U. S. 2,980,529.

### Treats Ferrous Metals

**Process for treating ferrous metals, S. C. Davis and W. G. Ray (assigned to Chas. Pfizer & Co., Inc.), Apr. 25, 1961.** In the preparation of iron and steel for porcelain enameling, the cleaned surfaces are pickled in citric acid or glycolic acid. Then they're coated with nickel. U. S. 2,981,633-4.

### Structural Steel

**Method of making corrosion-resistant steel, C. W. Wheatley (assigned to A. O. Smith Corp.), May 9, 1961.** In the production of a structural steel that resists alkaline corrosion, a small amount of pulverized mill scale or iron-oxide ore is added to the steel during teeming. Then capping or plating solidifies the steel. It also stops the reduction of added impure iron oxide by the carbon present in the steel. U. S. 2,983,598.

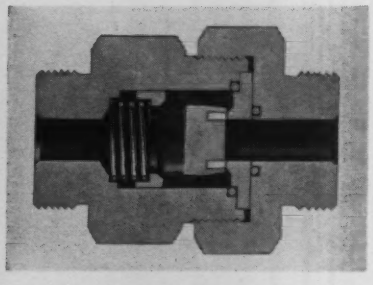
### Vertical Cooler

**Apparatus for cooling particulate materials, W. Zimmermann and J. Roder (assigned to Dravo Corp.), May 9, 1961.** The patent covers a vertical-cooler design for iron ore or sinter fines, pellets, and like materials. The cooler employs a helical conveyor to move the material which contacts large volumes of cooling air at low velocity. This banishes dust. U. S. 2,983,051.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

CRANES HOISTS
CONCO
CRANES HOISTS
CONCO
Custom-Engineered
Overhead Electric Traveling
Cranes in Capacities to
150 Tons. Write for Bulletin 5000B.
Material Handling Division
CONCO ENGINEERING WORKS, INC.
Mendota, Illinois
AFFILIATES: Spartan Tool Division—Powered Sewer Cleaning Equipment • Field Control Division—Barometric Draft Controls • Conco Building Products, Inc.—Brick, Tile, Stone

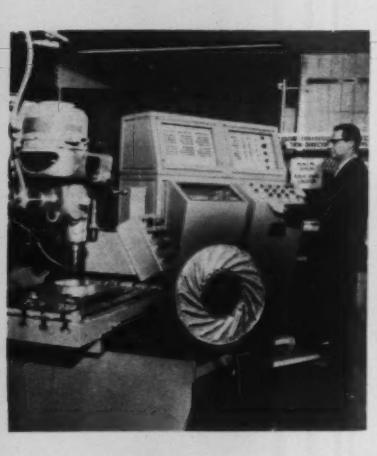
# New Materials and Components



## Silent Check Valves Curb Reverse Flow and Surge

Forget about leaks caused by galling of metal-to-metal valve seats. The soft resilient nylon seat in this new line of silent, O-ring check valves assures positive and leakproof shutoff. These valves suit pressures up to 6000 psi and temperatures from —20° to 275° F. Their cartridge construction makes inspection a snap. Two types are available: In-line or globe, in ¼-2 in. sizes. The removable bonnet in the globe type permits full internal access without breaking the line. (Combination Pump Valve Co.)

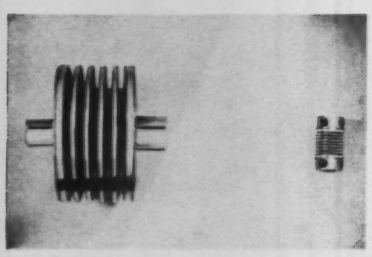
For more data circle No. 22 on postcard, p. 119



## Solid State Devices Serve Numerical Control

Now, the first solid-state numerical-control system is ready for machine-tool applications. Heart of the system is a transistorized, 3-axis director unit. This component develops command signals as phase-modulated square waves. Feedback signals represent the actual machine-cutting position. At the director, these are compared with the command signals. The result is a phase-difference indication. This difference between the actual and desired machine-cutting position is amplified to control the servo loop which acts as the prime mover. It positions the axes. For power, either an electric, or a hydraulic motor will do the trick. Besides the major benefit of compactness, the new system boasts reliability. And even though it employs the latest advancements in solid-state physics, it's simple to operate. (Thompson Ramo Wooldridge Inc.)

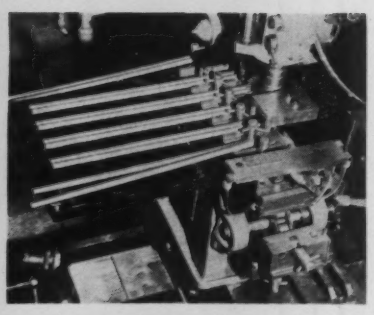
For more data circle No. 23 on postcard, p. 119



## Miniature Flexible Couplings Smother Backlash

A new line of bellows couplings suits sensitive applications. The miniature sizes are ideal for servomechanisms and computers. In these units, backlash and cyclic angular variations between two shafts cannot be tolerated. However, the new bearings stretch or compress while the shafts rotate. Thus, they soak up erratic shaft motions. Side thrust on bearings is no problem. It's too small to worry about. (Sterling Precision Corp.)

For more data circle No. 24 on postcard, p. 119



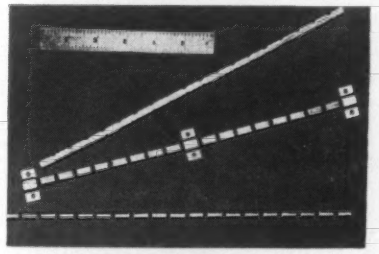
## Milling Machine Attachment Upgrades Production

How do you mill a ¼ x 5/16-in. slot on one end of ⅜-in. cold-rolled shafts of varying lengths and produce 1400 pieces per hr? It's an easy task with a new attachment that automatically carries the parts beneath a milling cutter. The newcomer mounts on the table of a milling machine or surface grinder. Its powerful chain drive moves a matched set of hardened holding fixtures or collets along precision ways. These holding bases are hardened and ground to an accuracy of ±0.00025 in. This guarantees ±0.001-in. part tolerances, run after run. (AutomaticMILL, Inc.)

For more data circle No. 25 on postcard, p. 119

## Damps Vibration

An easy-to-apply, vibration-damping device is also inexpensive. It cuts down vibration response in such structures as air-frame com-

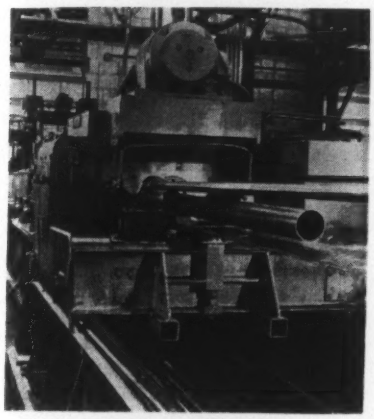


ponents, electronic chassis, air ducts, and shock and vibration test fixtures. In other words, this new product offers a simple, efficient and inexpensive solution to structural-fatigue and excessive-noise problems caused by uncontrolled vibrations. Tests have shown that attaching the damper to a typical structure will reduce its vibration response by as much as 85 pct. Also fatigue life increases dramatically; from a few minutes to several hours. Since it's an add-on device, the damper comes supplied with special mounting clips. (Barry Controls Div., Barry Wright Corp.)

For more data circle No. 26 on postcard, p. 119

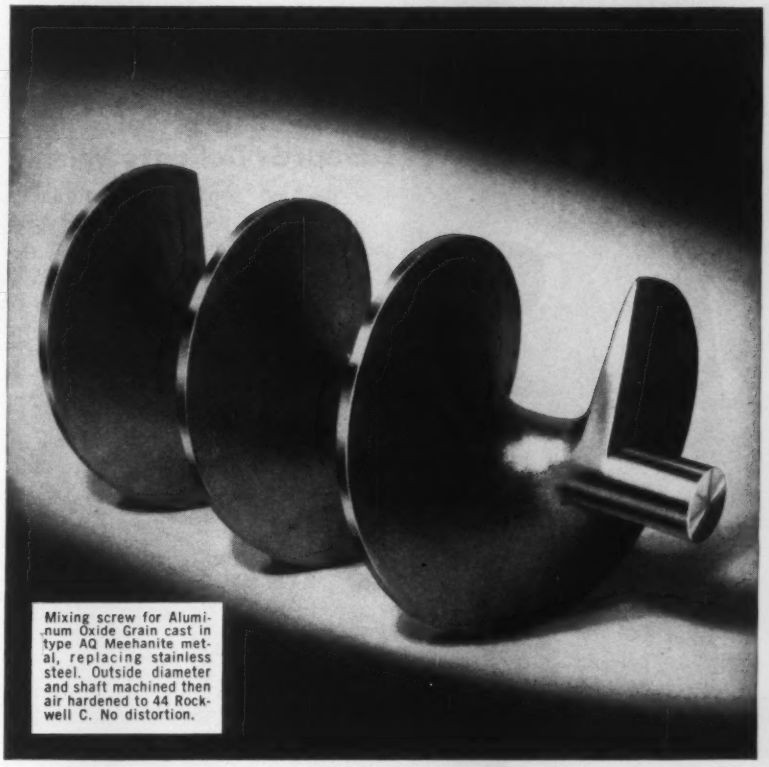
## Structural Tubing

More than 400 new sizes and gages have been added to a line of round, square and rectangular tub-



ing. The new range of sizes results from the rapidly increasing demand for tubing of all shapes, especially in the larger sizes and gages. Depending on the size and gage in-


**MEEHANITE MEANS BETTER CASTINGS®**



Mixing screw for Aluminum Oxide Grain cast in type AQ Meehanite metal, replacing stainless steel. Outside diameter and shaft machined then air hardened to 44 Rockwell C. No distortion.

**New AQ Meehanite®**

**Air Hardens....No Distortion**

This new wear and abrasion resisting type of Meehanite® is a low cost metal of extremely high hardenability that offers many performance and cost advantages. It is recommended for critical castings of varying section size that require a Brinell hardness over 400 and which must retain accurate dimensions.

Such castings, made in type AQ Meehanite which has an "as cast" hardness up to 280, can be machined first, if necessary, and then safely air hardened without the risk of cracking or distortion associated with water or oil quenching. Final hardness — up to 500 Brinell; tensile strength — 66,000 psi.

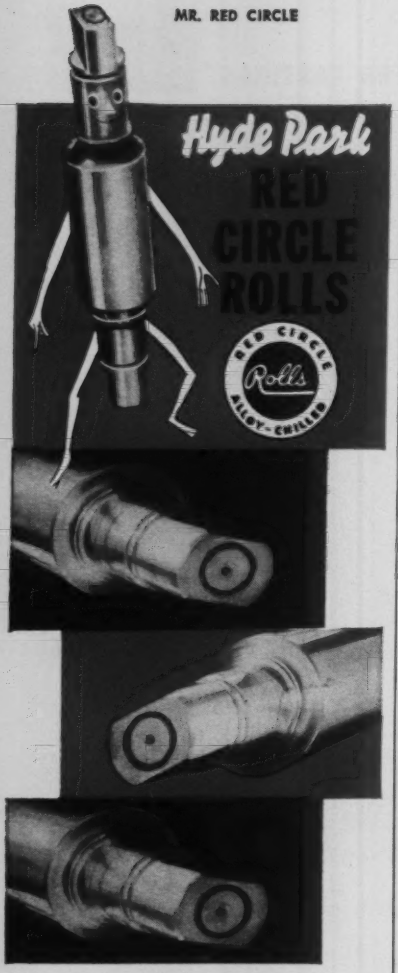
AQ Meehanite® can easily be locally hardened for improved wear resistance of working faces and edges of such parts as dies, punches, cams, sheaves, etc. Another advantage is that the hardness at elevated temperatures is considerably better than most engineering materials. Also, AQ Meehanite, because of its manganese content, exhibits considerable work hardening during service.

For more information about AQ Meehanite®, send for your free copy of our 4-page folder, B-48. Write to Meehanite Metal Corporation, 714 North Avenue, New Rochelle, New York.

**MEEHANITE METAL**

*MEEHANITE CASTINGS ARE MADE ONLY BY MEEHANITE FOUNDRIES.*

MR. RED CIRCLE




A Roll for Every Purpose

Our engineers will be glad to work with you in the production of any special rolls or rolling mill equipment.

IRON BASE TYPE ROLLS
Nickel Alloy Grain Rolls
Nickel Chilled Rolls
Grain Rolls
Chilled Rolls
Moly Rolls
Nodular Iron Rolls

Hyde Park
FOUNDRY AND MACHINE CO.
HYDE PARK
Westmoreland County, Penna.

Rolls
Rolling Mill Equipment
Gray Iron Castings

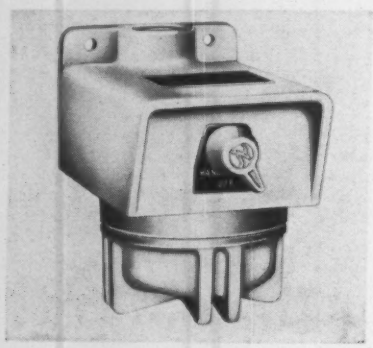
## DESIGN DIGEST

volved, tubing is available in AISI carbon-steel grades ranging from 1008-1040 analysis. (Republic Steel Corp.)

For more data circle No. 27 on postcard, p. 119

### Guards Delicate Wiring

Shielded controls and threaded construction provide unusual protection for the delicate wiring de-

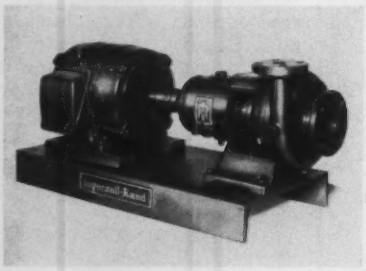


vices housed in these explosion-proof fittings. As you might expect, they're also dust and weather proof. The fittings come with various standard wiring devices including tumbler switches, manual motor starters, push-button stations, selector switches and pilot lights. All operating controls have threaded, stainless-steel shafts. They mount on the front face of the body. Each is equipped for padlocking in any position. (The Pyle-National Co.)

For more data circle No. 28 on postcard, p. 119

### Cradle-Mounted Pumps

For general-chemical and process service, a new line of centrifugal pumps handles both corrosive and



non-corrosive liquids. Units in the line come in alloy, ferrous or non-ferrous materials. Three models cover the range from ½-50 hp, with a top delivery of 1000 gpm. Total-available head ranges to 240 ft. All pump casings are of vertically-split design. Flanged suction and discharge disconnections are provided on all castings. Jacking bolts speed removal of casings and impellers. For versatility, the pumps may be driven by any dependable source of power through a flexible coupling, gear or belt-and-sheave arrangement. (Ingersoll-Rand Co.)

For more data circle No. 29 on postcard, p. 119

### Corrects Misalignment

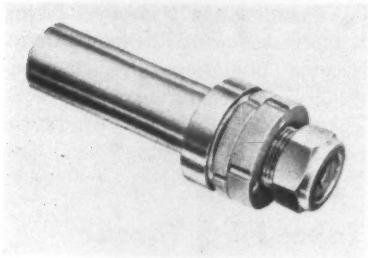
This full-floating tool holder compensates for both angular and parallel misalignment between tool and machine spindle. In most cases, angular misalignment exists. But angular float alone is not enough to correct for hole angularity. The tool centerline must shift to accommodate the angular misalignment. In the new holder, a disk-spring arrangement counterbalances the holder and the tool. This makes oversize or bell-mouth holes a thing

WARD
For Countless Uses
of
SPRING
STEEL

AMERICA'S LEADING SUPPLIER
Where
SERVICE and QUALITY
is the rule

WARD
STEEL
CO.
Boston—Cambridge, Mass.
Chicago, Ill.—Greensboro, N. C.

of the past. The newcomer is ideal for turret lathes, automatics and radial drills. Another bonus: Its

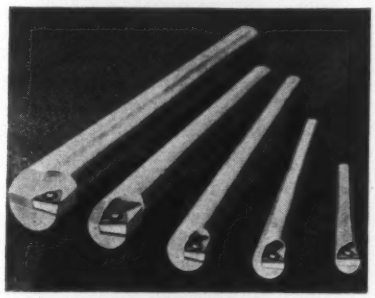


small body diameter permits work in confined areas. (Erickson Tool Co.)

**For more data circle No. 30 on postcard, p. 119**

## Small Boring Bars

Five sizes of boring bars, with diameters of ⅜, ½, ⅝, ¾ and 1 in., supplement a line of these items with 1- to 2½-in. diam. Respective lengths of the newcomers are 6, 8, 10, and 12 in. The bars take standard triangular inserts and chip breakers. One advantage claimed

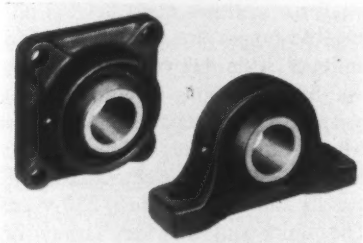


is that the units eliminate chatter and greatly reduce vibration and deflection. (Kennametal Inc.)

**For more data circle No. 31 on postcard, p. 119**

## Sleeve Bearings

These flanged and pillow-block sleeve bearings are designed to solve



many difficult bearing problems. For one thing, they're self-lubricating and self-aligning; ideal for inaccessible locations where maintenance is difficult. In addition, the bearings operate at temperatures up to 1000°F. Contaminating and corrosive conditions don't bother them. But that's not the whole story. A unique design feature extends their life. When the set screw, that holds the sleeve-bearing cartridge in the housing, is backed off, you can rotate the cartridge 180°. This adds new life from the opposite side of the bearing. Even more unusual, this can be done with the bearing on the shaft. (Link-Belt Co.)

**For more data circle No. 32 on postcard, p. 119**

## Powered Cylinder

Guaranteed for one year against burnouts due to overheating, these powered cylinders produce linear motion. Basically, the unit is a gear motor with a crank mounted on the output shaft. This crank is machined to receive cams which actuate limit switches that are mounted on the upper part of the gear housing. These cams and limit switches adjust to stop the crank pin at around-the-clock positions. Starting controls include manual-push-button or automatic-timing options. As a result of the rapid accelerat-


*Here's the*
**PHOSPHATE COATING**
*You asked* **TURCO TO MAKE**

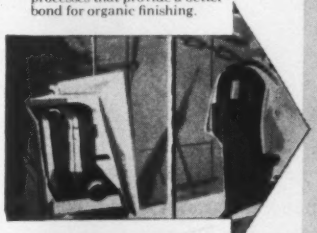
HERE'S HOW **PAINTITE** SCORES ON SURVEY'S 12 "MOST WANTED" FEATURES...

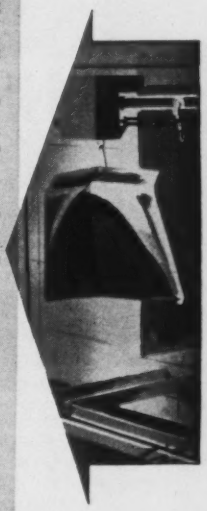
**–Formulated as Result of Industry-Wide Survey...**

During the first six months of 1959, Turco undertook an extensive survey of the phosphate coating market. Hundreds of users of these coatings were interviewed. Thousands of questions were asked. When the answers were tabulated, Turco began the task of building an iron phosphate process to the *exact specifications* called out in the survey.

The new process is now available. It is called Turco Paintite. Paintite has been thoroughly field-tested in the production lines of a dozen Turco customers. It has passed the most severe tests with flying colors. Turco is proud to announce the addition of Paintite to its ten other Turcoat phosphate and conversion coating processes that provide a better bond for organic finishing.

1. **SUPERIOR CLEANING**–Exclusive wetting system provides heavy-duty uniform cleaning. Cleans & phosphates simultaneously.
2. **TEMPERATURE VERSATILITY** – Efficient anywhere within range of 140° to 180°F. Temperature control is not important.
3. **LOW FOAMING** – at any temperature within recommended range.
4. **LESS POST RUST**–Eliminates post rusting problem often encountered with iron phosphate processes.
5. **NO WHITE STREAKING**–Extra free rinsing. Leaves no residue.
6. **ECONOMICAL**–Low in initial cost. Low in maintenance cost. Low in cost per sq. ft. Long-lived, even under mass production use.
7. **UNIFORM COATING**–even on edges and points. Won't show through on low-pigmented paints.
8. **USE VERSATILITY**–used by immersion, spray washer or steam cleaner.
9. **LESS SLUDGE** – less scale. Minimizes clean-up problems.
10. **RESERVE ACIDITY**–combats alkaline water conditions. Constant control not necessary.
11. **SUPERIOR SERVICE**–by Turco's vast network of technically trained servicemen, located in industrial centers throughout the world.
12. **REQUIRES ONLY 3 STAGES**–for dip or spray washing. Can be efficiently used in 5-stage operations, if desired.



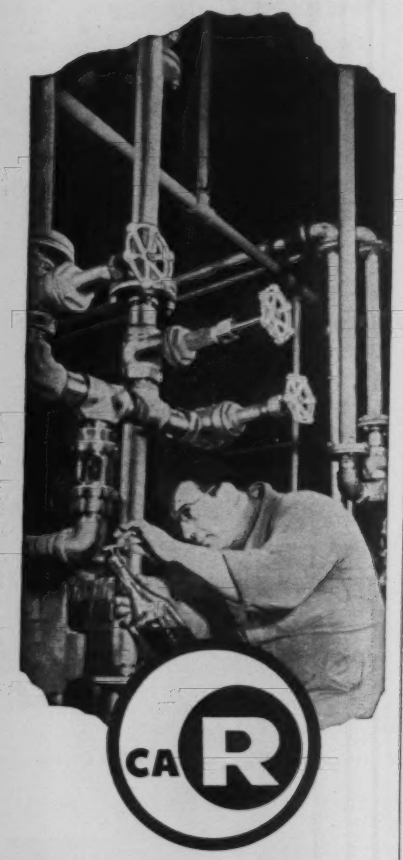


**FREE!** VALUABLE BOOKLET
PHOSPHATING REFERENCE CHART
TECHNICAL DATA BULLETIN

*Get the full story on Paintite and the other ten phosphating and conversion coating processes in the complete Turcoat line. Write for your copy, along with Turco's Phosphating Reference Chart, today!*

**TURCO PRODUCTS, INC.**
Chemical Processing Compounds
24600 South Main Street, Wilmington, California
FACTORIES: Rockdale, Ill., Houston, Wilmington, London, Rotterdam, Sydney, Mexico City, Paris, Hamburg, Montreal, Manila, Naha (Okinawa)
Offices in All Principal Cities

TURCO PRODUCTS, INC.
24600 South Main St. Wilmington, Calif.
**MERELY AFFIX COUPON TO COMPANY LETTERHEAD**
Please send valuable booklet with Phosphating Reference Chart and full details on Paintite. I understand there is no cost or obligation on my part.
NAME
TITLE IA



CA R

STAINLESS

pipe & fittings in stock...

Stainless steel piping for process installations, like the one pictured in Mogen David Wine Company's modern Chicago plant, can be readily supplied from our warehouse stock.

We maintain a large inventory of light-wall, standard, and extra-heavy stainless pipe in a variety of sizes and analyses—plus threaded and welding fittings, and valves.

Rely on C. A. Roberts Co. for prompt service and expert technical assistance on your Stainless Piping requirements.

C.A. ROBERTS CO.

*Steel & Aluminum Tube Specialists*

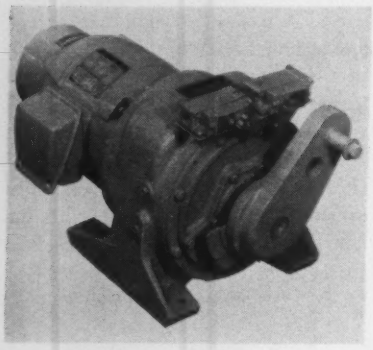
Dept. I-6, 2401 25th Ave., Franklin Park, Ill. GL 5-6400

*6 warehouses serving the middlewest*

CHICAGO • DETROIT • INDIANAPOLIS
ST. LOUIS • TULSA • N. KANSAS CITY



ing and braking action of the electric motor, the thrust rod is capable

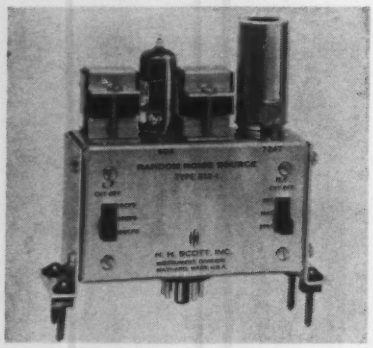


of a wide variety of functions. (Westinghouse Electric Corp.)

For more data circle No. 33 on postcard, p. 119

## Provides Random Noise

A new series of random-noise sources provide random "white" noise with Gaussian amplitude distribution. The units localize an octal socket for both standard console-power input and random noise output. Thus, great design flexibility is available for system and laboratory applications. Random noise simulates electrical signals and disturbances, sounds, and vibrations for general investigations and environmental testing. (H. H. Scott, Inc.)



For more data circle No. 34 on postcard, p. 119

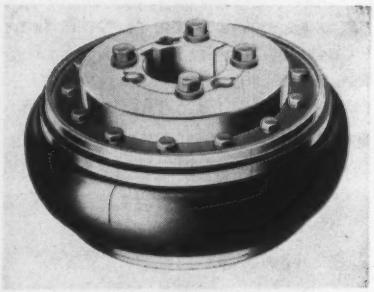
## Upgrades Appearance

A sparkling new finish gives a decorative brushed - metal appearance to electro-coated strip steel. It offers manufacturers and product designers reduced finishing costs and improved sales appeal. The new finish is available in base steel of all carbon and temper ranges in thicknesses from 0.050-0.008 in. and in widths to 22 in. It fabricates easily. In fact, in mild forming operations, it's as convenient to handle as mild steel. There's no distortion of the brush-finish design. (Pittsburgh Steel Co).

For more data circle No. 35 on postcard, p. 119

## Takes High Torque

For high-torque requirements, a heavy - duty, flexible - cushion coupling is the largest and newest addition to a line of couplings. It has more than twice the torque capacity of the next smaller size, or 400 hp per 100 rpm. Even with this performance, it accommodates angular



and parallel shaft misalignment. The couplings also absorb float, and shock and vibration. They're available from stock with bushings for shafts up to 7-in. in diam. Or, the units may be ordered bored-to-size for shafts as large as 9 in. (Dodge Mfg. Corp.)

For more data circle No. 36 on postcard, p. 119

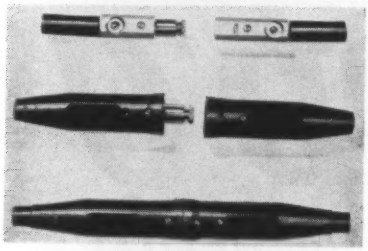
## Sensitive Control

Designed without an enclosure for direct incorporation into equipment, a calibrated pressure-vacuum control combines high sensitivity small size and low cost. Several adjustable ranges are available within limits of 30-in. Hg vacuum and 500 psi. Switch actions include normally-open, closed and double-throw. All are suitable for ambients up to 180° F. Standard electrical ratings are 15 and 20 amp, 115/230-v ac. The units suit a wide variety of applications such as welding equipment and centrifuges. (United Electric Controls Co.)

For more data circle No. 37 on postcard, p. 119

## Connects Cables

A detachable cable connector assures high-pressure mechanical connections every time without heat or special tools. Here's how it does

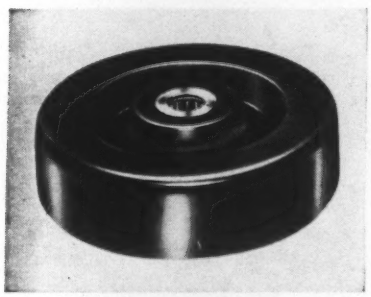


it. A simple ball screw of large diameter tightens on the bare cable strands with a steel wrench. This screw presses the strands into a solid nugget. This crushes the strand oxide assuring maximum current flow from the cable to the connector. Efficient in either aluminum- or copper-welding cable, this method of installing cable takes less than two minutes. (Tweco Products, Inc.)

**For more data circle No. 38 on postcard, p. 119**

## Wheels Resist Water

These water-resistant wheels especially suit those applications requiring unusual water or chemical resistance as well as quiet, long-wearing characteristics. The tough, but attractive, wheels are available from stock in any practical size from 3¼-16 in. diameter. Tread



widths range from 1½-4 in., for capacities up to 8000 lb. (Albion Industries, Inc.)

**For more data circle No. 39 on postcard, p. 119**

## Rugged Cap Screws

Heavy-duty cap screws in diameters up to 3½ in., and lengths up to 30 in., are now available as part of a standard line. These heavyweights should eliminate some of the high expense and delay of custom-manufactured cap screws in very-large sizes. Their average minimum tensile strength is 160,000 psi, ample for even the most severe vehicle and machine-maintenance requirements. This means you can tighten them down hard to prevent the wear and tear caused by machine vibration. (Premier Industrial Corp.)

**For more data circle No. 40 on postcard, p. 119**

## Programming Cylinder

Precise programming and automatic repetition are possible with new electro-hydraulic cylinders. When led through a series of strokes

to perform a given operation, the cylinder develops proportional electric signals for a recorder. After this initial step, the unit duplicates the operation on command. Normally, the cylinders are used in closed-loop hydraulic circuits along with servo valves. Actually, an integral transducer develops the signal. It emits a constant-feedback signal that prevents overshoot and hunting. (Guerin Engineering, Inc.)

**For more data circle No. 41 on postcard, p. 119**

## Priority Valve

To completely isolate any portion of a hydraulic or pneumatic system below a preset point, a new line of priority-relief valves operate at pressures up to 2000 psi. Absolute system pressure, rather than differential pressure, actuates the units. In addition, positive spring pressure assures fail-safe valve closure, whenever downstream pressure drops below the preset point. Thus, there's no danger of pressure with-


USE THE COUPON BELOW FOR MORE INFORMATION ON NEW ECONOMICAL

**PYROGARD C**
*FIRE-RESISTANT FLUID*

See ad on following pages

Mobil

Mobil Oil Company, Room 2058D
A Division of Socony Mobil Oil Co., Inc.
150 East 42nd Street, New York 17, N.Y.

Gentlemen: I am interested in learning how new PYROGARD C fire-resistant fluid can aid my operation.

NAME _____
POSITION _____
COMPANY _____
ADDRESS _____
CITY _____
ZONE STATE _____

# FOR IMPROVED PLANT SAFETY PLUS

## *NEW, ECONOMICAL*

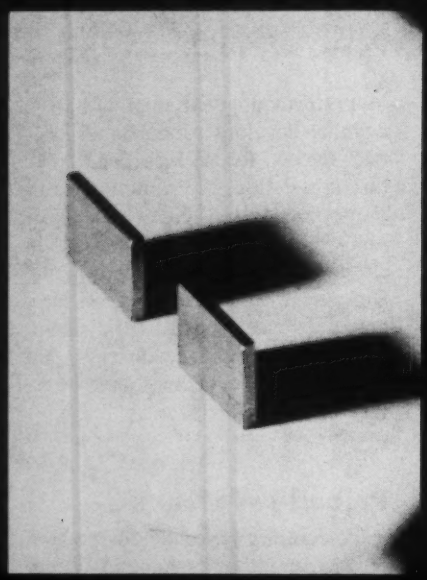
# *PYROGARD C*

## *FIRE-RESISTANT FLUID*

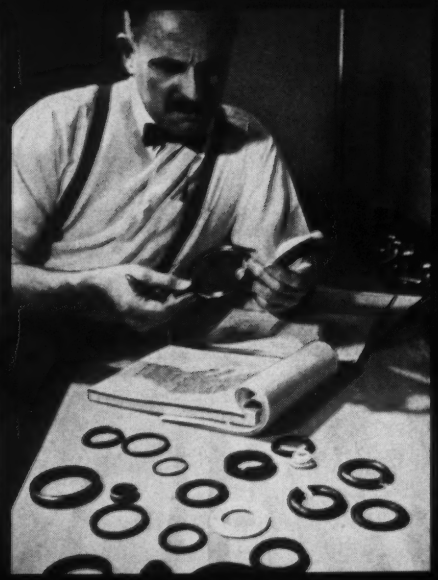
**Mobil**

HERE'S HOW PYROGARD C CAN HELP YOU!

— PYROGARD C helps you protect your property and personnel against fire. Ignition resistance is demonstrated here. Hydraulic oil (left) bursts into flame immediately while PYROGARD C (right) resists combustion when poured onto steel plate heated to 1000F.



Good anti-wear properties assure long pump life — PYROGARD C fire-resistant fluid is designed for most pumps and pressures encountered in plant hydraulic equipment . . . gives excellent protection against pump wear for fluids of this type. Pump vane at left is new. Vane at right has 1000 hours of service with PYROGARD C at 160F and 1000 PSI. Wear is almost undetectable.



Compatibility with seals, metals eases fluid installation — PYROGARD C fire-resistant fluid is easily installed because it has no adverse effect on most packings, seals, or hoses, and is non-corrosive to metals normally found in plant hydraulic systems. Containing effective rust inhibitors, PYROGARD C fire-resistant fluid gives excellent protection against rusting wherever it contacts metal.

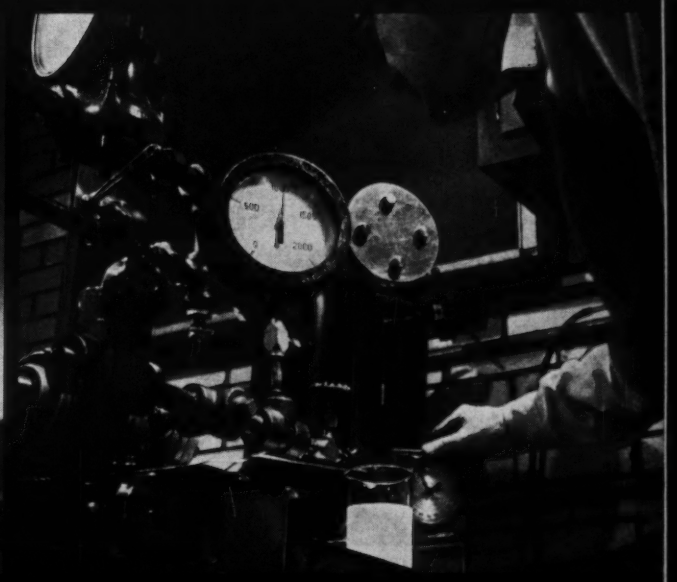
# POSITIVE HYDRAULIC RESPONSE...

Now, the makers of world-famous Mobil petroleum hydraulic oils bring you PYROGARD C, a new fire-resistant fluid that offers positive hydraulic response plus improved plant safety . . . at low cost.

PYROGARD C fire-resistant fluid is a water-in-oil emulsion containing special chemical addition agents. It's been thoroughly field tested in actual service . . . will give excellent performance under conditions such as those encountered in press welders, furnace-door openers, ladle-tilting mechanisms, scrap balers, and die-casting machines.

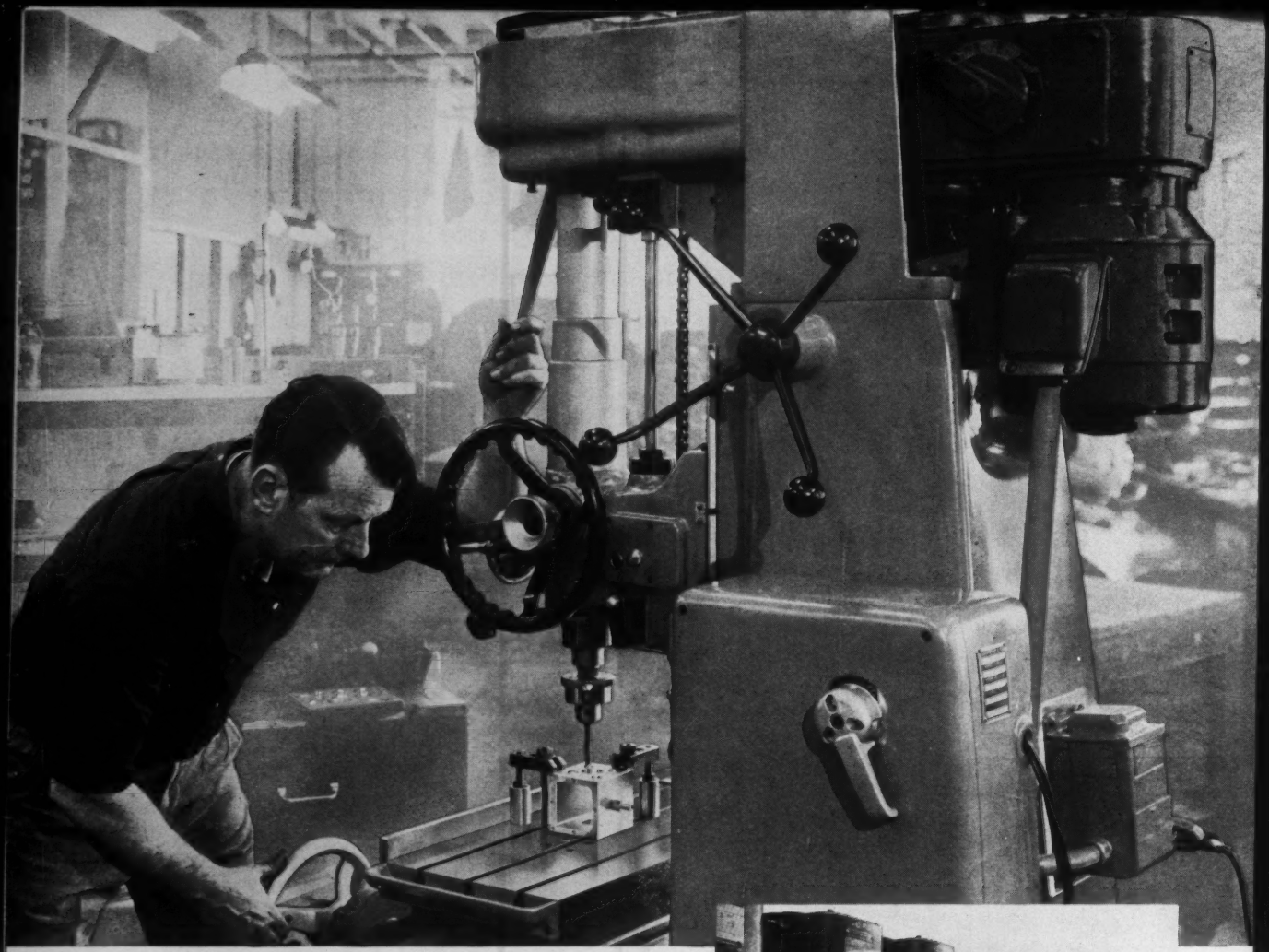
The major benefits provided by PYROGARD C fire-resistant fluid are detailed below. In addition you receive the help of experienced Mobil Engineers in applying it to your equipment. Their specialized know-how in the installation and maintenance of fire-resistant fluids will make the procedure sure and simple. Examine the benefits of PYROGARD C fire-resistant fluid —then contact your nearest Mobil Representative.

**Long-term stability in storage and use assures uninterrupted production**—PYROGARD C fire-resistant fluid is highly stable even at higher-than-normal temperatures—resists breakdown, foaming and water separation—keeps pump parts and screens free of deposits. And with PYROGARD C, water evaporation is retarded by a thin oil skin that forms when the emulsion is at rest, yet readily remixes when fluid is agitated (shown above).



**Unusual flow properties assure positive hydraulic response yet reduce leakage**—PYROGARD C fire-resistant fluid has unusual viscosity characteristics . . . resists leakage at static joints, yet gives rapid flow and response elsewhere in the system. In apparatus above, a specially designed "leak chamber," introduced into hydraulic system, shows the PYROGARD C leaks less than ordinary hydraulic oil.

MOBIL OIL COMPANY, 150 East 42nd Street, New York 17, N. Y.



Mr. A. A. Lindberg, Design Engineer,
Moore Special Tool Co., Inc. states:
**"On our Model 1½ Jig Borer...**

# General Electric Polydyne® Drives Help Us Maintain 0.000070"* Accuracy"

"Efficient control of vibration is the reason that the majority of our Model 1½ jig borers are equipped with General Electric Polydyne drives. Competitive drives have never fully solved this problem," states A. A. Lindberg, Design Engineer for Moore Special Tool Co., Bridgeport, Connecticut.

"Moore tests each Polydyne drive on a specially constructed bracket," continued Mr. Lindberg. "Vibration readings are taken at three points, and every Polydyne drive tested has been under the vibration limit of 0.001 inch and virtually free of operating noise.

"Another reason that our Model 1½ has proved popular is that the Polydyne drive gives an infinite number of operating speeds with just a simple adjustment of the dial to the desired rate."

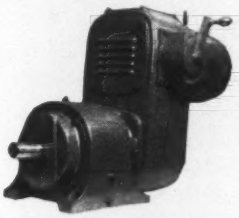
When your application requires low-cost adjustable speed combined with reliability and ease of maintenance, investigate G-E Polydyne drives. Your General Electric Sales Engineer has full details. Or, write for bulletin GEA-6806, Section 854-06, General Electric Company, Schenectady 5, N. Y.

* Seventy Millionths

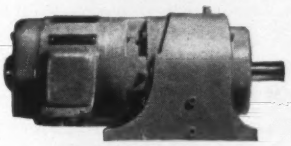
GENERAL ELECTRIC

**GENERAL ELECTRIC OFFERS A *COMPLETE* LINE OF LOW-SPEED DRIVES 1/8 TO 200 HP**

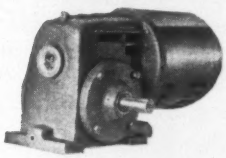
**Select from G.E.'s PLUS LINE of compact mechanical power transmission equipment! A full range of ratings is available—many directly from stock.**



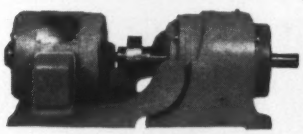
General Electric Polydyne Drive



Integral-type Gear Motor

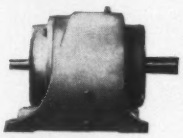


Right-angle Shaft Gear Motor



All-motor Gear Motor

Footed Speed Reducer



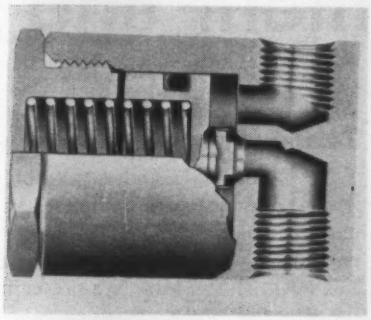
Shaft-mounted Speed Reducer

Member of American Gear Manufacturers' Association

GENERAL ELECTRIC



drawal to auxiliary systems. Above the preset pressure, the valve is always full-open. This means almost

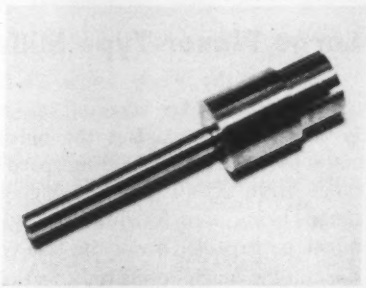


zero drop in the flow to the downstream system. (Circle Seal Products Co., Inc.)

For more data circle No. 42 on postcard, p. 119

## Extends Shafts

Precision shaft extensions increase the working length of like-size shafts. However, these new units also serve as adapters to standardize shafts of unlike diameters. They're machined from #303 stainless in ⅛-, 3/16- or ¼-in. shaft sizes. They come with the same size male and female ends, or in any combination of these sizes. The overall extension length of 1⅝



in. provides a full inch of usable-shaft surface. All diameters are concentric to 0.0005 in. (Pic Design Corp.)

For more data circle No. 43 on postcard, p. 119

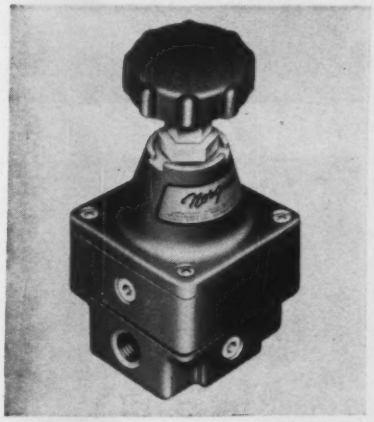
## Glass Laminate

Available in continuous sheets, strips and coils, a new epoxy laminate features a glass cloth (Mylar) facing. It boasts high strength/weight ratio. It's also moisture and chemical resistant. In addition, Mylar assures a pore-free, high-dielectric surface. It's bonded to both faces and bond strength exceeds 750 psi. Thickness range: 0.015-0.062 in. (Swedlow, Inc.)

For more data circle No. 44 on postcard, p. 119

## Regulates Air Pressure

With built-in relief, a new precision pressure regulator operates with complete freedom from hunt, hum and chatter. It features exact repetition and freedom from drift over long periods of time. Providing reliable pressure control up to the maximum air flow recommended for ¼-in. pipe, it also gives ac-



curate readings at pressures below 1 psig. The use of primary air for control causes fast response. The unit's accuracy stems from small pilot-valve movement and temperature-compensated spring. (C. A. Norgren Co.)

For more data circle No. 45 on postcard, p. 119

## Low-Flow Pump

Since all its working parts are fully enclosed, a low-flow, controlled-volume metering pump suits chemical feed systems. It accurately meters many types of liquids, such as corrosive acids, toxic chemicals and water-treating chemicals. The pump is easy on the operator, too. He can adjust capacity while it's running. This is done either manually, or automatically from a control signal. It also means more flexible pumping operation. In addition, metering accuracy is 1.0 pct or better. (Milton Roy Co.)

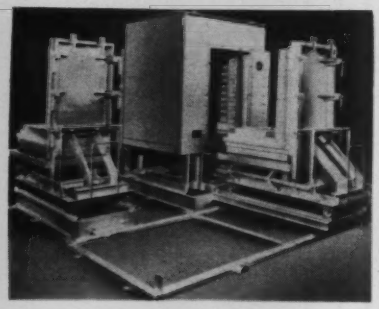
For more data circle No. 46 on postcard, p. 119

# New Equipment and Machinery

## Tool-Setting Equipment Slashes Job-Change Time

New cross-slide and turret toolholders are part of a complete system for making chucker setups faster and easier. Here's how it saves time. All cutting tools are preset in the new holders using bench gages. But first you need dimensions for the settings. These are programmed on layout drawings. Thus, while the machine is producing, cutting tools are readied. When the change-over is made, the tools produce accurate parts on the very first cut. With this system, a normal 4-hour job can be tooled and ready to run in half the time. Repeat setups average 30 minutes or less. It's another step towards automatics on short runs. (Scully-Jones & Co.)

For more data circle No. 47 on postcard, p. 119



## Car-Bottom Kilns Provide Uniform Temperature

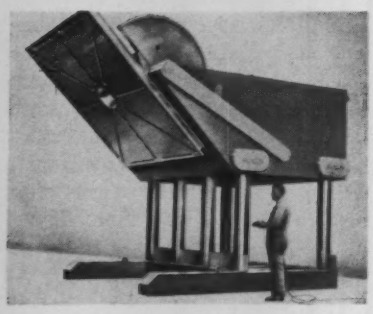
At temperatures to 2750°F, a modernized line of car-bottom kilns suits a broad range of firing and calcining jobs. Two power packages are available in each kiln size. One is a low-power model for standard-cycle firing. The other high-power model handles accelerated firing at high temperature. Adequate space around the charge assures cross radiation and reflection. This in turn means uniform temperatures. When controlled cooling isn't needed, two kilns can team up with a single power and control package. This cuts equipment costs. (The Harper Electric Furnace Co.)

For more data circle No. 48 on postcard, p. 119

## Large Planer-Type Miller Roughs and Finishes

Carrying the work on a 26-ft table, a 60-ft miller takes off about ⅜-½ in. of stock. But the finish cut is only 0.010 in. Cutting speeds range from 25-40 ipm, the higher ranges being used for finishing. As might be expected from the size of the cut, the machine sits on 8 feet of concrete. This provides the necessary rigidity and vibration resistance. During machining, 24 sliding parallels, inserted under the cast-iron bed, furnish additional support for the work and contribute to machining accuracy. Five separate motors supply the power. (DeVlieg Machine Co.)

For more data circle No. 49 on postcard, p. 119



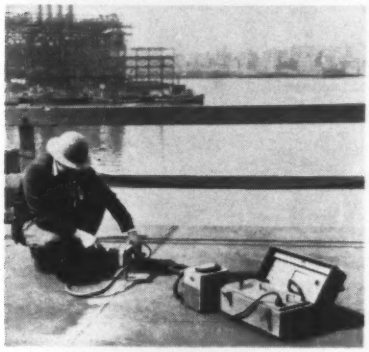
## Welding Positioner Features Geared Elevation

Here is the largest powered-elevation positioner available today. Full load is 120,000 lb. Fifty-four in. of geared elevation lifts the top load at 15 ipm to a full 90° tilt of the table. The geared-elevation principle relies on a 6-post elevator base. This base boasts 10-in. OD x 1-in. wall tubes with spur-rack teeth for the lift pinions. Each post has four guide rollers to establish rigidity during elevation. All elevator mechanisms, including the posts, are housed inside the chassis. Thus, nothing interferes with turning large weldments into position. (Aronson Machine Co.)

For more data circle No. 50 on postcard, p. 119

## Detects Flaws

A portable, one-man, magnetic-particle testing unit produces 1000-amp ac or half-wave dc current to



detect surface and sub-surface flaws in ferrous materials. It's ideal in industries such as marine construction, petroleum, aircraft, bridge building and welding where true portability and high power are desirable. The tester can be used with prods or coils. In addition, it's small enough to fit through openings 18-in. wide. These two features spell out the unit's versatility. (Picker X-ray Corp.)

For more data circle No. 51 on postcard, p. 119

## Versatile Electrode

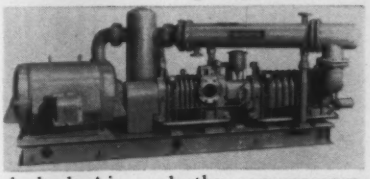
Vertical-up welding with no electrode breakdown or loss of arc direction is one of the special abilities of a new electrode. It's especially designed for out-of-position work in

shipbuilding, pipe welding, construction, general maintenance and other jobs where fit-up can be poor. The reason for the improved characteristics is a new coating formulation that strengthens the weld crater. Both the Navy and the American Bureau of Ships have approved the electrode. (Welding Products Div., A. O. Smith Corp.)

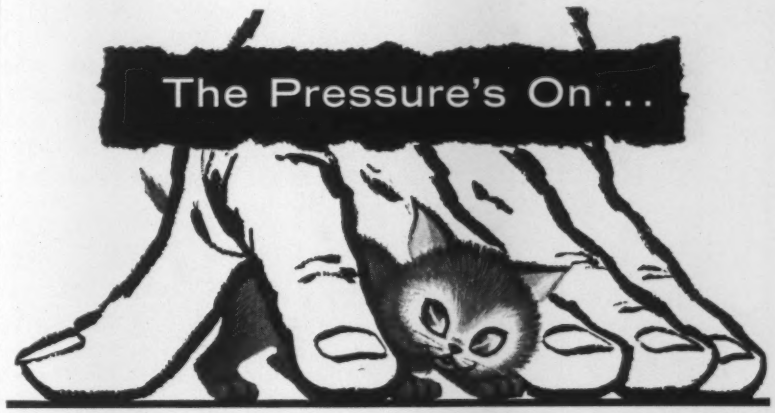
For more data circle No. 52 on postcard, p. 119

## Maintains Air Purity

New 2-stage units will deliver up to 3000-cfm of oil-free air at 100 psig. They particularly suit applications requiring high-purity air. Driving the two axial-flow, screw-type compressors is a standard 3600-rpm motor or turbine. There are no vanes, valves, pistons or rings to wear. Thus, upkeep costs are



slashed. Air cools the compressors, but a shell and tube intercooler with a temperature-controlled water


with *Sof-Loc** HYDRAULIC HOLDDOWN SYSTEM

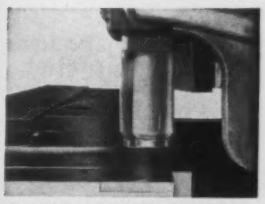
...GENTLE but POSITIVE

...exclusive on Lodge & Shipley **POWER SQUARING SHEARS**

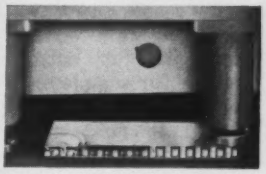
Tons of pressure, but applied so gently and quickly... using air for speed, oil for pressure... that's the secret of the exclusive Lodge & Shipley Sof-Loc Holddown. Quietly, without damage to easily marred surfaces, it gives unequalled holding power for fast, "dead accurate" shearing of light sheets or heavy plates.

Sof-Loc is but one of a combination of features you need but won't find on any other shear. These features and the advantages they give are described in a new 20-page catalog of Lodge & Shipley Shears: capacities from 10 gauge to ⅜" for heavy duty and high production shearing.

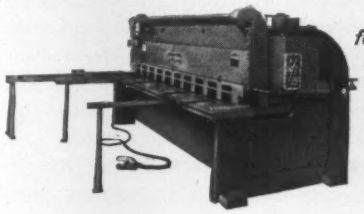
Request Bulletin S-347 from: The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio.



Holddown fingers are individually adjustable and removable.



Impact eliminated, so is damage to easily-marred material.

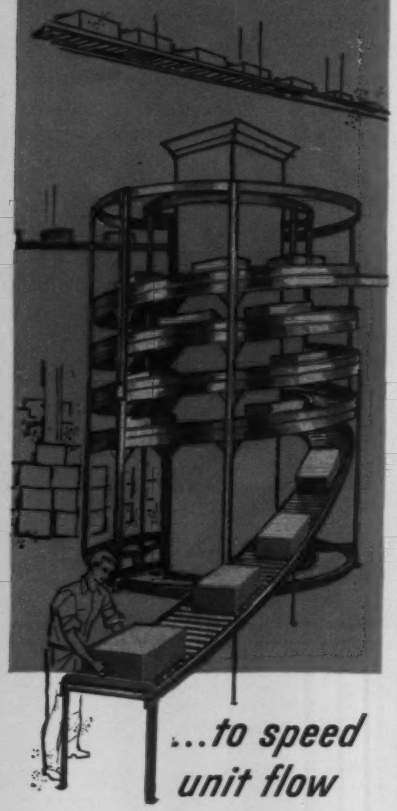


*for shear excellence, choose...*

**Lodge & Shipley**

*PATENTED, TRADEMARK REGISTERED

**LAMSON**
**CONVEYING SYSTEMS**
***USE WASTED SPACE***



***...to speed unit flow***

LET LAMSON ENGINEERS show you how. You may have more space than you think . . . much more than you presently are using.

Thousands of industrial and warehousing operations are benefiting from efficient, pre-engineered LAMSON CONVEYING SYSTEMS that feature full utilization of all *inner*-space.

Conveyor units alone are not enough. Engineering skill and experience are equally important in building an efficient system.

For over 80 years, LAMSON engineers have demonstrated a high order of both, becoming famous for complete, "Turn Key Jobs." If you're having *inner*-space problems . . . check LAMSON. Write today to 104 Lamson Street, Syracuse, New York.

LAMSON

**LAMSON CORPORATION**

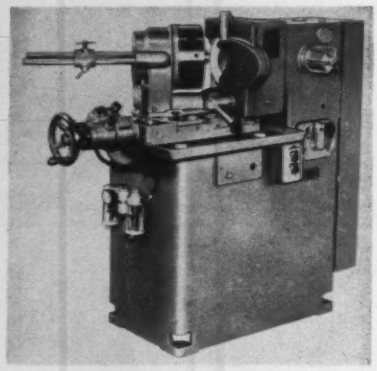



regulator separates the compression stages. (Roots Connersville Blower, div. of Dresser Industries, Inc.)

For more data circle No. 53 on postcard, p. 119

## Renews Drill Points

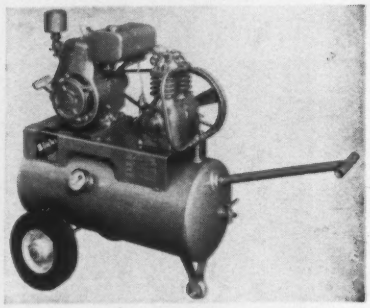
Here's the latest addition to a line of tool-room grinding equipment. It's a completely-new, drill-pointing machine, available in three styles. Improvements in the unit are based on experience gained through the production of thousands of drill pointers in previous years. The most evident change is in exterior styling. The major-mechanical change is the addition of a scroll-type chuck. It mounts in anti-friction bearings and is complete with recirculating lubrication to insure long life. Another important change is the grouping of all controls at the front of the machine. The unit grinds right-hand drills in the 2-, 3-, or 4-flute style in a size range of ½-3 in. diameter. All flutes are ground in one continuous motion. (The Oliver Instrument Co.)



For more data circle No. 54 on postcard, p. 119

## Air Compressors

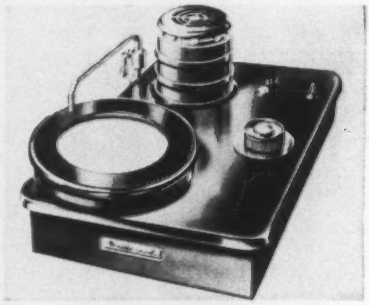
New, tank-mounted, portable air compressors fill any general compressed air need, especially in spray-painting systems. The units combine the right volume and pressure with a matched-volume air receiver of ample reserve capacity. The new line comes in four models—two with a 1-hp electric engine, and two with a 2½-hp gasoline engine. All models provide operating pressures of 70-80 psi from a 15-gal tank. All are designed to give high volume at low cost with their 2-cylinder, single-stage, air-cooled compressor units. (Binks Mfg. Co.)



For more data circle No. 55 on postcard, p. 119

## Grinds and Polishes

After 2½ years of development, a new polisher-grinder is now available to metallurgical and quality-control laboratories for fine metallographic-specimen preparation. It's a versatile machine which uses an 80-1200 rpm variable-speed control with its ½-hp, dc motor to provide constant torque at all loads. Vibration and rollout are virtually eliminated. And, its compact low silhouette reduces operator fatigue. The pan, lap, polishing wheel and cover can be changed as one unit in seconds, without danger of contamination. Fifty prototypes have been in service for two years without a single factory repair or replacement part. (Geoscience Instruments Corp.)



For more data circle No. 56 on postcard, p. 119

## Casting Impregnator

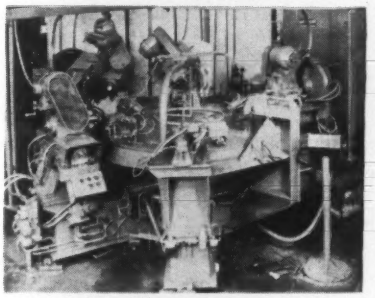
With electric heating elements as standard equipment, a new casting-impregnation machine comes in packaged form. The assembly consists of a 325-gal autoclave, a 450-gal sealant supply tank and sepa-

rate hot- and cold-water rinse tanks, each 400-gal capacity. The heating elements are mounted in the sealant supply tank. This eliminates burnt-out elements by preventing contact with settled solids at the bottom of the tank. Remote thermostats control the heating elements. (Prence Mfg. Co.)

**For more data circle No. 57 on postcard, p. 119**

## Milling Machine

This automatic milling machine performs various straight and angular milling operations on six plier forgings at a production rate of 240 pliers per hr. It consists of a 6-station index table with four stations arranged for machining, one for



loading and one for unloading. Angular adjustment of the unit heads provides the versatile feeding necessary to handle the many sizes and angular positions of milling cuts that are required on a series of plier forgings. Each unit is complete with adjustable hydraulic feed. (Swift Ohio Corp.)

**For more data circle No. 58 on postcard, p. 119**

## Advanced Toolholder

According to the company, "All preconceived notions were discarded and a completely-new engineering approach was taken in developing this new toolholder." Heart of the novel design is a cam action lock. An eccentric on the central cam pin engages the insert. This provides a positive lock that can't be loosened by vibration or pressure. Since locking is inside the insert, rather than outside, there are no protruding screws or clamps. With only three parts (plus insert), the newcomer is remarkably simple. Only one wrench is needed. Tests indicate remarkable holding power

WITHIN SECONDS!

Modern LAMSON carriers can fly oversized blueprints through AIRTUBES at a velocity of 25 feet per second. No other communications system can approach this type of service. And the time saved in transit is time gained in production.

*Modern* LAMSON AIRTUBE SYSTEMS have developed and improved their load bearing capacities to such an extent that today AIRTUBES are without peer in providing all 'round, swift, message delivery service to industry.

AIRTUBE speed *plus* load flexibility reduces downtime on production lines . . . eliminates cost of manual messengers . . . permits centralization of supplies and equalizes the workload among all personnel throughout the day.

Bring yourself up-to-date on *modern* LAMSON AIRTUBE SYSTEMS. Send for the new AIRTUBE catalog. Just clip this advertisement to your letterhead and mail to 104 Lamson Street, Syracuse, N. Y.

LAMSON

PIONEERS *the Conquest* OF INNER SPACE

LAMSON CORPORATION

PLANTS IN SYRACUSE AND SAN FRANCISCO • OFFICES IN ALL PRINCIPAL CITIES

Manufacturers of Airtube® (Pneumatic Tube Systems) • Integrated Conveying Systems • Pallet Loaders • Selective Vertical Conveyors • Bookveyors® Clinical • Trayveyors® • Food Service Systems • Blowers and Exhausters • Exidust® Central Vacuum Cleaning Systems • Dryset® Air Vacuum Systems

**STEELARC®**

**CUTTING ELECTRODE**

**CHAMFER ROD**

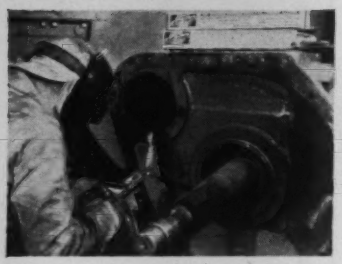
**the versatile electrodes for field work to JOIN · CUT · SHAPE**

**Used extensively in construction • road building • farming mining • job shops • maintenance work**

STEELARC® is All-State's specially coated electrode for all mild steel work —flat, vertical, overhead positions. Pass on pass without slag removal. AC or DC. One rod inventory.

All-State CUTTING ELECTRODE for fast, economical arc cutting of steel, cast iron, stainless, high chrome armor plate. AC or DC.

All-State CHAMFER ROD for chamfering, gouging, bevelling, routing and channeling without oxygen or air. Made with special compounded flux coating to protect rod and speed work. AC or DC.



High speed Cutting Electrode slices through cast iron machine housing. This one low-cost electrode cuts any ferrous alloy, lowers inventories.

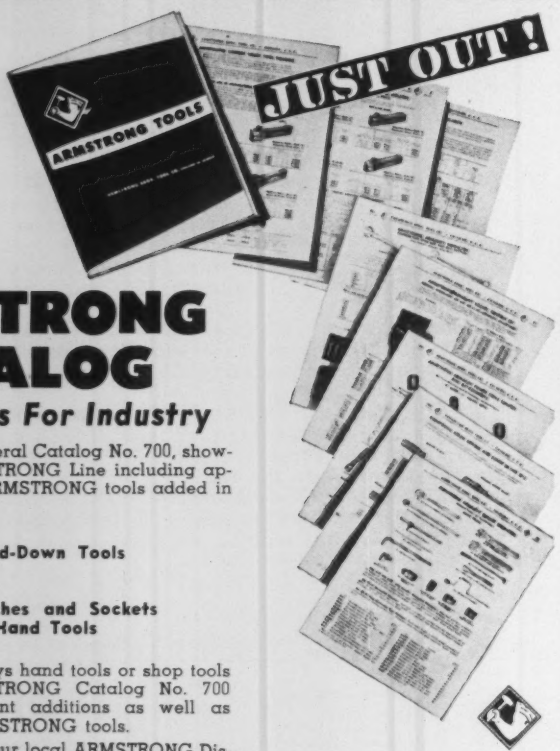
**Economical • Practical • Versatile • Distributors everywhere.**

Send for a free copy of our 56-page Manual and Catalog.

All-State

**ALL-STATE WELDING ALLOYS CO., INC.**
White Plains, N.Y. Dial 914 WH 8-4646
QUALITY WITH SERVICE






*New*

**ARMSTRONG CATALOG**

***Quality Tools For Industry***

New ARMSTRONG General Catalog No. 700, showing the complete ARMSTRONG Line including approximately 330 new ARMSTRONG tools added in these categories:

**Tool Holders**
**Set-Up-and-Hold-Down Tools**
**Tool Bits**
**Wrenches**
**Ratchet Wrenches and Sockets**
**Miscellaneous Hand Tools**
**Pipe Tools**

Anyone who uses or buys hand tools or shop tools needs this free ARMSTRONG Catalog No. 700 showing these important additions as well as thousands of other ARMSTRONG tools.

Write direct, or phone your local ARMSTRONG Distributor (Distributor name furnished upon request).

**ARMSTRONG BROS. TOOL Co.**

**5209 W. ARMSTRONG AVE. CHICAGO 46, ILLINOIS**


## NEW EQUIPMENT

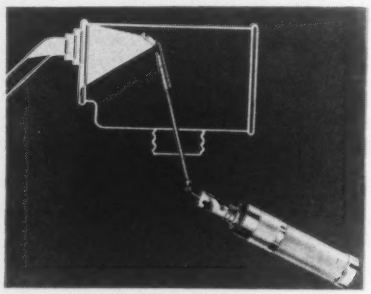
in the locking mechanism. The insert breaks before it loosens.

(Metallurgical Products Div., General Electric Co.)

**For more data circle No. 59 on postcard, p. 119**

### "Sees" Inside Bores

To inspect bore walls with a minimum ID of ¾ in., a new inspection light has a rotating mirror mounted at the end of a shaft immediately below the illuminating lamp. The 45° mirror angle lets you look around the corners, with its right-angle sight line. It easily rotates through a full 360°. Bore inspection is just one application. The unit checks electrical and mechanical connections in hidden installations. Also, because it has no complicated optical system, you don't need to baby it. The inspection light withstands rough treatment. (Welch Allyn, Inc.)



**For more data circle No. 60 on postcard, p. 119**

### Cutoff Machine

Featuring quick setup for semi- or fully-automatic operation, an air-operated machine cuts off tubing, bars and extruded shapes. It also suits short-run or maintenance-type

# UNIFORM

## Uniformity of
## KEYSTONE WIRE
## helps make jam-free staples

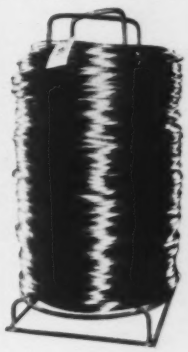
ISM® AROUND THE WORLD

To produce jam-free staples calls for absolute uniformity of wire temper and diameter and unvarying staple dimensions. Holding to tolerances of plus or minus .0005″, International Staple and Machine Company, Herrin, Illinois, manufacture their Gold Crown® carton closing staples. The wire used is a special bright finish, copper-coated steel wire of cold rolling quality furnished by Keystone Steel & Wire Company. This round steel wire must have (1) correct temper throughout the coil, (2) critical tensile range and (3) a copper coating which works perfectly with International Staple's high-speed staple forming machines.

Mass production of steel staples by International Staple has been increased because of the forming characteristics of Keystone Wire which allow the wire to conform exactly to required tolerances and shaping.

In addition Keystone designed and built a platform carrier to control wire take off. This carrier means less scrap, longer runs, better protection in transit, better storage, easier wire handling and less time to set up the wire for the cold rolling operation.

Specifications for your product can be accurately analyzed and every detail closely controlled at Keystone. The wire you require can be uniformly produced through the latest and most exact methods known to the steel industry. Send us your specifications for our recommendations.



*No. 16 platform carrier*
*600 lbs. continuous coil.*

*Keystone Steel & Wire Company • Peoria, Illinois, U.S.A.*

KEYSTONE COLD ROLLING QUALITY WIRE STUDY

**KEYSTONE**
**WIRE FOR INDUSTRY**
MADE AT PEORIA, ILLINOIS, U.S.A.

IMPORTANT SAVINGS

*Lower initial cost*
*Long life*
*Ultra high quality*

Small Diameter
ROLLS

Special alloys with tough, fine-grained finish. Surfaces as fine as 3 micro inches RMS. Chrome plating available.

RECONDITIONING:
Rolls reconditioned like new at costs averaging 25% of new rolls. Rolls can be reconditioned several times!

Voss
ENGINEERING CO.

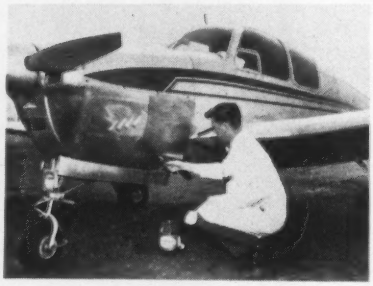
7301 Penn Ave. Pgh 8, Pa.
Churchill 2-4422

cutting, although the machine itself is completely air operated, all controls are electrical. Special work-feed jaws hold material on both sides of the cutter. This allows the use of narrow blades or abrasive wheels. In fact, cutting speeds up to 1500 pieces per hr. have been reported. To get this output, the 14-in. wheel travels at 3000 rpm on a 1-in. spindle. The machine is 36-in. wide, 45⅜-in. front-to-back and 65-in. high. (Power Control Products, Inc.)

For more data circle No. 61 on postcard, p. 119

## Cleaning Paste

A new chemical paste cleans and treats aluminum surfaces in a single operation. It's ideal for aluminum products that are too large or awkward to handle by dip-tank methods. It also permits field repair of parts or surfaces that require coating or painting. The translucent organic paste applies easily through spraying, brushing or wiping. Chemical reactions occur during drying. They produce an organic conversion coating on the metal surface. Rinsing off the dried paste leaves a surface with exceptional adhesive properties for bonding or coating. The paste also serves as a superior cleaner for stainless - steel and chrome - plated surfaces. (Hughson Chemical Co.)



For more data circle No. 62 on postcard, p. 119

## Pulls Timing Gears

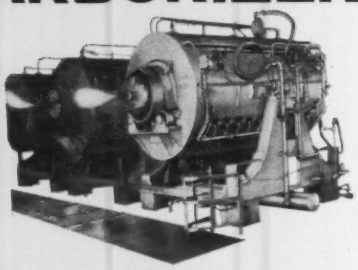
A new 2- or 3-way, flange-type puller quickly and easily removes harmonic balancers and timing gears. It doesn't matter whether they have two or three tapped holes. The new puller is ideal for work on late-model cars. It handles bolt-circle diameters of 1½-4⅝ in. The unit consists of puller body, forcing screw, special plug, three hex-head cap screws ⅜-in.-16 Nc x 3 in., and three hex-head cap screws ⅜-in.-24 NF x 3 in. (Owatonna Tool Co. )

For more data circle No. 63 on postcard, p. 119

## Grinding Wheels

Developed for rapid stock removal, a new line of aluminum-oxide grinding wheels delivers pre-

AGF
ROTARY CARBURIZERS



AGF's Work in Motion Principle Assures Uniformity of Case!

AGF Rotary Batch Carburizers provide the most reliable method for DEEP CASE CARBURIZING and LIGHT CASE HARDENING.

Recent AGF combustion and control system improvements provide an even greater degree of temperature and product uniformity than was ever before possible.

For POSITIVE COST REDUCTION and PRODUCT IMPROVEMENT, investigate the NEW Improved AGF Rotary Carburizers.

Write for catalog IA 607 today

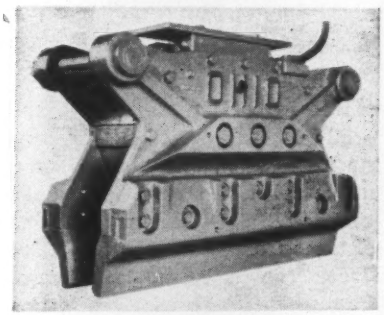
AMERICAN GAS FURNACE CO. 1004 LAFAYETTE STREET, ELIZABETH, N.J.

mium grinding results. These excellent results are the norm on aircraft-parts grinding, on crush-form applications and on surface-grinding operations. The wheels take heavy feeds on a variety of materials from high-speed steel and regular alloy steel to low-carbon steel and boiler plate. However, that's not all; the manufacturer states that the newcomers grind with fast-cutting action and hold their form well. (Mocklin Co.)

**For more data circle No. 64 on postcard, p. 119**

## Handles Steel Shapes

A new, bipolar lifting magnet has unusual versatility in handling steel structural shapes. It lifts random




lengths and sizes of structurals that don't require careful positioning or stacking. These shapes include beams, channels, angles, Z-sections and sheet piling. Lifting capacity of the standard model is approximately 3000 lb, depending on the length of the beam, single or dual pickup etc. Weight of the unit is about 3100 lb. (The Ohio Electric Mfg. Co., a subsidiary of Howell Electric Motors Co.)

**For more data circle No. 65 on postcard, p. 119**

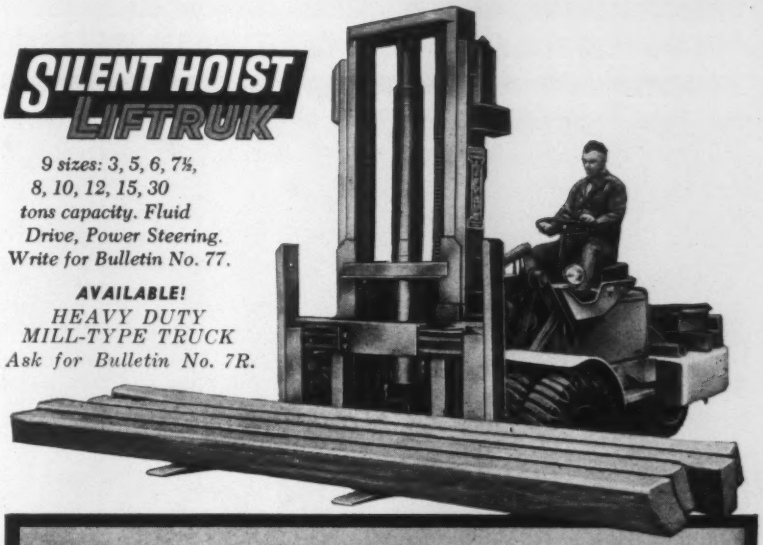
## Safety Wedge

Worry no more about personal injury or property damage from accidental rolling of heavy objects. A new safety wedge will end these anxieties. Made of heavy rubber, with a ribbed thread that gives a firm, non-skid grip on the floor, this device has a resilient top surface that cushions as it fits itself to the curve of the roll or cylinder. With a height of 2½ in. and a thread-length of 6½ in., the safety wedge suits rolls of any size—from


SILENT HOIST LIFTRUK

*9 sizes: 3, 5, 6, 7½, 8, 10, 12, 15, 30 tons capacity. Fluid Drive, Power Steering. Write for Bulletin No. 77.*

***AVAILABLE!***
*HEAVY DUTY MILL-TYPE TRUCK*
*Ask for Bulletin No. 7R.*



**shrink days into hours...**

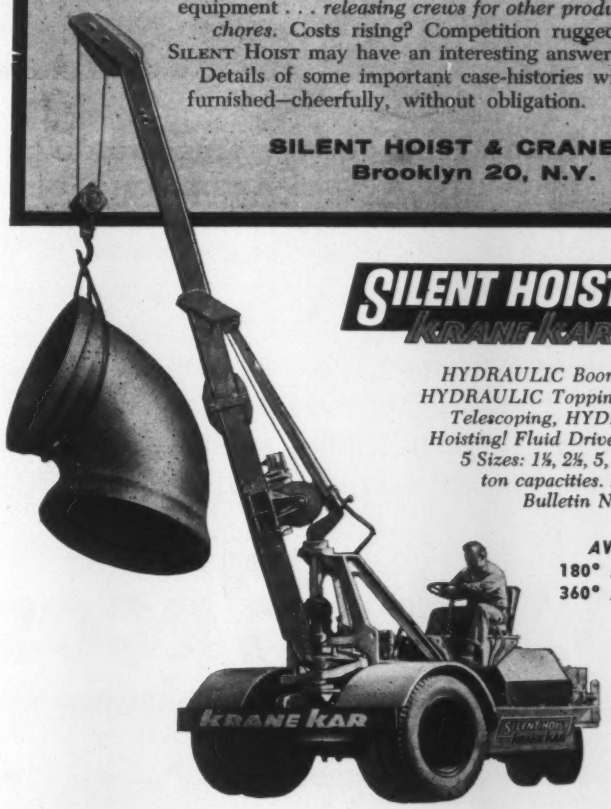
Tedious, costly work of Loading, Unloading and Stacking that take many men, many days can be compressed into a few hours . . . with just *one* man operating SILENT HOIST materials handling equipment . . . *releasing crews for other productive chores.* Costs rising? Competition rugged? SILENT HOIST may have an interesting answer for you! Details of some important case-histories will be furnished—cheerfully, without obligation.

**SILENT HOIST & CRANE CO.**
**Brooklyn 20, N.Y.**

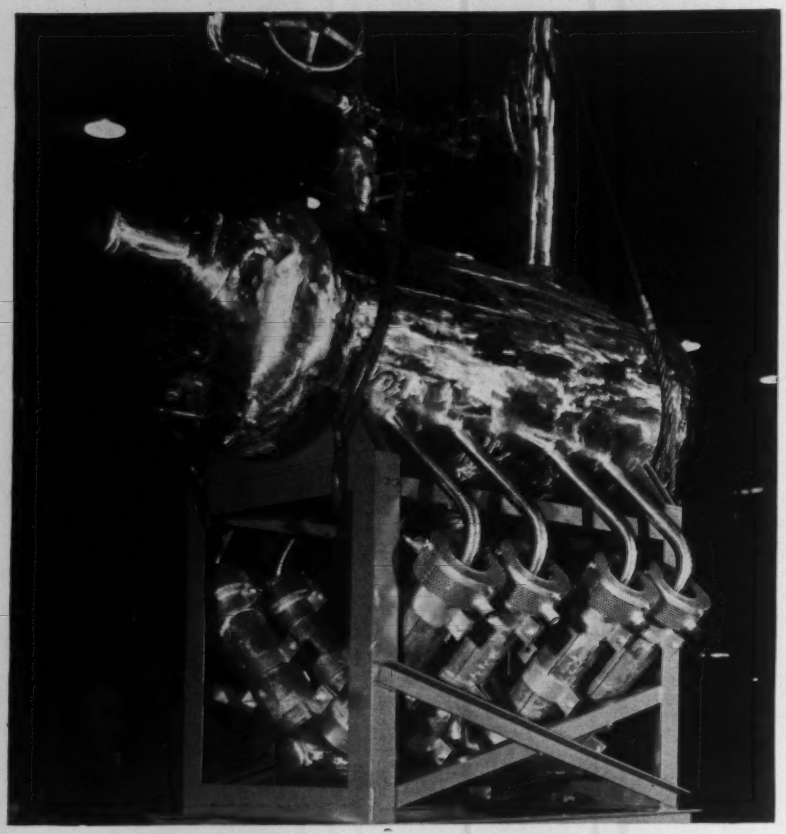
SILENT HOIST KRANE KAR

*HYDRAULIC Boom Swinging, HYDRAULIC Topping, HYDRAULIC Telescoping, HYDRAULIC Load Hoisting! Fluid Drive, Power Steering. 5 Sizes: 1½, 2½, 5, 10, 12½ ton capacities. Ask for Bulletin No. 79.*

***AVAILABLE!***
**180°** *SWING BOOM*
**360°** *FULL BOOM ROTATION*



## ARCOS EB INSERT FOR ROOT PASS WELDING



*Job report courtesy of Dominion Bridge Co., Ltd., Montreal, Quebec*

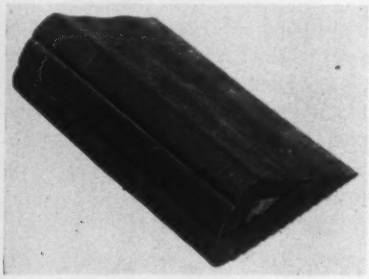
**Smooth, crack-free root welds made in nuclear pressure vessel from one side only.** This NRU reactor surge tank is made of Type 347 stainless, 3" thick with 26" I.D. It is designed for operation up to 630°F. at 2400 psi. Because welding could be done from the outside only, Arcos EB Consumable Weld Inserts were used for the root passes. Result: complete fusion, crack-free, with smooth inner surface. Write today for complete data on EB Weld Inserts.

ARCOS

**Arcos Corporation • 1500 S. 50th St. • Philadelphia 43, Pa.**


## NEW EQUIPMENT

½-in. bars or pipes up to drums or rolls of 4-ft diam. Standard lengths are 4, 6, and 12 in. Con-

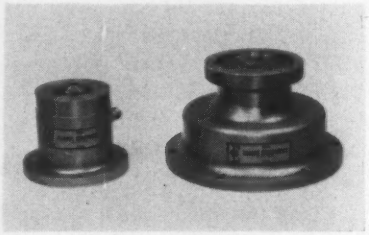


tinuous wedges can be furnished up to 10-ft long. (John G. Shelley Co., Inc.)

**For more data circle No. 66 on postcard, p. 119**

### Collet Chucks

A collet chuck assures repetitive positioning of the part. Thus, the depth of machining remains constant. In addition, an internal stop in the collet, or on the face of the collet, will always remain the same distance from the cutting tool. Pot collets can be used to advantage. Because the positive-opening action rules out delay in the release of the part, the tool suits automatic loading. During closing, the wedge action of the chuck surrounds the collet. This wedge action forms a mechanical lock between the part, the collet, the wedge and the body of the part. Thus, the part, the chuck



and the work table become a single unit. This allows a heavier cut without chatter. (Adams Equipment)

**For more data circle No. 67 on postcard, p. 119**

### Cereal Core Binder

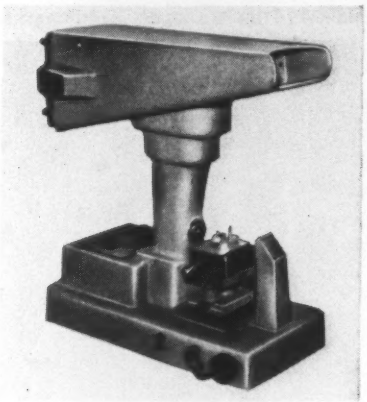
This new heavy-density, cereal binder flour may reduce the cost of your castings. Continuing tests demonstrate the binder's unusually-high overhang properties, even

when it is used at reduced levels. While the binder flour itself is only small part of core costs, it can be an important factor in total-casting costs by reducing faulty and rejected castings. To be specific, the company claims you can use 20-pct less of the new product and still upgrade your casting results. (General Foods Corn Mill)

For more data circle No. 68 on postcard, p. 119

## Sets Close Tolerances

A bench-model optical projector boasts special fixturing for fast, precise, clearance setting between bearings and the pivot shaft in instruments. The equipment consists of a compact, high-accuracy optical projector with magnifications avail-



able from 10X to 125X. A special, air-actuated staging fixture holds the instrument assembly. The shadow image of the pivot shoulder is magnified and projected on the chart-screen where the operator sees it sharply and clearly enlarged. This chart screen has reference and tolerance lines. By adjusting and bringing the image within the tolerance lines, the end-shake setting is made. (Stocker & Yale, Inc.)

For more data circle No. 69 on postcard, p. 119

## Mesh-Belt Furnaces

Designed to give pure atmosphere, a modern line of mesh-belt furnaces suits continuous brazing, annealing and sintering jobs in many industries. They're economical, too. Here's why. Gas-flame curtains and adjustable end doors assure low, atmosphere-gas consumption. These features also ban infiltrating air—a


**BETTER STAINLESS WELDS WITH ARCOS**

**Arcos produces a full line of stainless filler metals**...coated electrodes, bare electrode wire, consumable inserts, bonded fluxes. This across-the-board selection of filler metals, plus Arcos stainless welding know-how, assures you of the selection of the right filler metal for the most economical arc-welding process—manual, semi-automatic or automatic. Where you use Arcos stainless filler metals you build up the quality of your welds and push down your welding costs.

ARCOS

**Arcos Corporation • 1500 S. 50th St. • Philadelphia 43, Pa.**

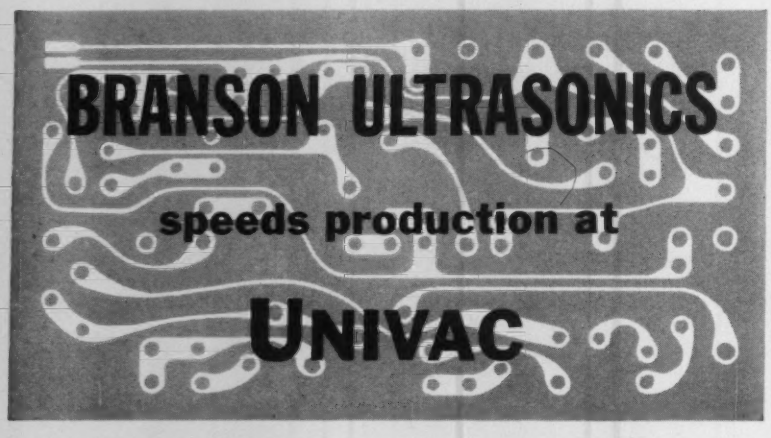
must for pure atmosphere. Furthermore, constant time/temperature cycles yield uniform treatment. (Harper Electric Furnace Corp.)

For more data circle No. 70 on postcard, p. 119

## Production Lathe

Made for fast metal removal, this powerful 7½-hp lathe is accurate to toolroom tolerances. It produces fine finishes at production - line speed. Heavy cuts, as well as the most delicate cuts on frail work pieces, are within its scope. Another bonus, the new lathe picks up repeat diameters with speed and ease. Thus, economical, efficient operation in small and medium job-lot turning is a reality. Here are some reasons why. For exact cut lengths, micrometer-adjusted, carriage-slide steps trip the power feed to the carriage at any desired location. Quick reversing, with a full range of reverse speeds, allows full use of the rear-tool post—without chatter. (Pratt & Whitney Co., Inc.)

For more data circle No. 71 on postcard, p. 119


The problem: To remove flux from printed circuit boards, formerly done by hand brushing. This method was slow, expensive and not very efficient.

The solution: A "tailor-made" Branson/Univac system that cleans **completely, continuously,** and **automatically.** The ultrasonic installation consists of two 8 foot tanks, each powered by a 1000 watt generator. It is part of a continuous production line, which automatically supplies flux and solder, ultrasonically cleans and rinses, dries and unloads. This process enables Univac to increase production of printed circuit boards considerably. Ultrasonic cleaning assures complete cleanness at high production speed for critical components.

Whether your products are small or large, simple or complicated, you should investigate the use of ultrasonic equipment for your company. Branson's highly experienced, factory-trained specialists stand ready to assist you anywhere in the U. S. Tell us about your particular problem and Branson's engineering department will try to find the **best** possible solution in the **shortest** possible time.

SINCE 1946 — THE RESPECTED NAME IN ULTRASONICS

BRANSON INSTRUMENTS, INC.

Ultrasonic Power Division
23 Brown House Road, Stamford, Conn.


## Identifies Bar Stock

Installed over a production line, a new marking unit may be friction or power driven at any line speed. It's a rotary-offset printer for marking pipe, tubing, bar stock and similar ferrous and non - ferrous products. The offset principle is used because it gives larger characters on small product diameters and causes no character distortion in the final printing. The marker imprints products of any diameter, flats and most shapes. Trademarks,

identification or any other wording may be printed at desired intervals. (Jas. H. Mathews & Co.)

For more data circle No. 72 on postcard, p. 119

## Shear Welder

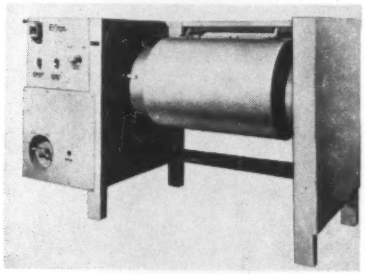
This tungsten, gas-shielded arc machine welds non-ferrous metal, steel and stainless steel. It allows any strip-forming machine to run continuously. There's no shut down for coil changes. The welder shears off the tail end of the outgoing coil and the leading edge of the incoming coil. Then it butts the two ends together and makes the weld. When the weld's done, it opens up. The strip continues on through. (Behrend Machinery, Inc.)

For more data circle No. 73 on postcard, p. 119

## Super-Fine Finishes

Exact control, to obtain a wide range of finishes, is possible with a

new vibrating-rotating tumbling barrel. Variable-speed drive and motor give the operator simultaneous control of frequency and degree of

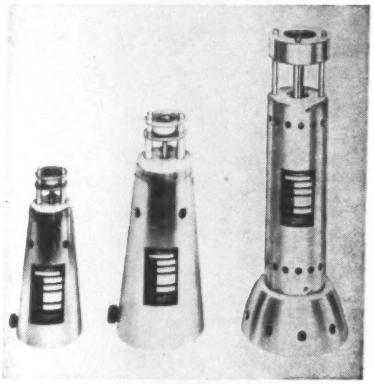


vibration. Great versatility means you can handle many finishing jobs in sequence without reloading the barrel. And simultaneous rotation and vibration produces super-fine finishes. Unusual rubber mounts support the barrel which has no springs. An eccentric-drive principle causes the vibration. (Minnesota Mining & Mfg. Co.)

**For more data circle No. 74 on postcard, p. 119**

## Ultrasonic Solder Pots

Available in 10-, 50-, and 100-w form, a line of ultrasonic solder pots aids improved, automated-assembly techniques for components and allied electronic parts. They effect the rapid and efficient tinning of leads on diodes, capacitors and other components. The cavitating action



of the pots cleans and solders simultaneously, without flux. (Gulton Industries, Inc.)

**For more data circle No. 75 on postcard, p. 119**

## Collapsible Crane

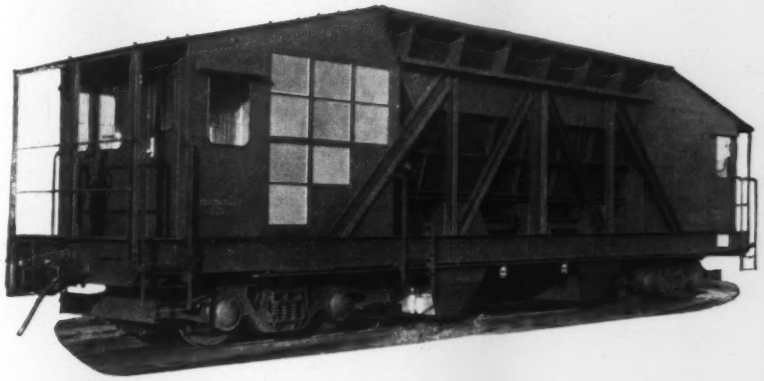
Here's a completely new product of great value in general maintenance and repair work. Extremely


. . . custom built

# ATLAS

## diesel-electric

# ORE-TRANSFERS



*75-ton diesel-electric transfer, single hopper, bottom dump with air-operated discharge gates and double-end control.*

Atlas builds steel plant cars to fit the exacting needs of each user. And each is constructed with the simplicity and ruggedness that defies obsolescence.

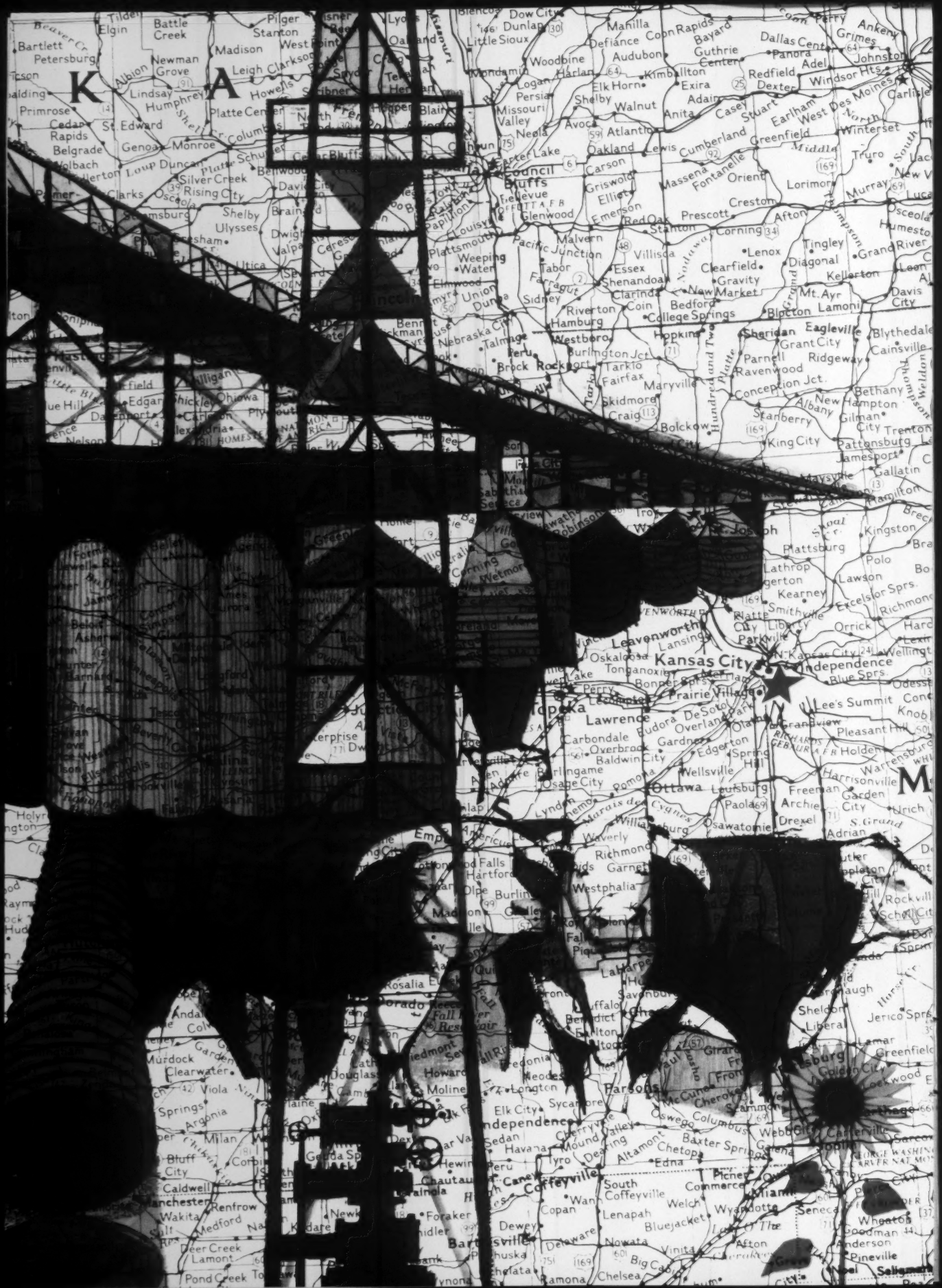
***SINCE 1896 . . .***

**Producers of Scale Cars, Ore-Transfers, Coal Larries, Door Machines, Coke Quenchers . . .**

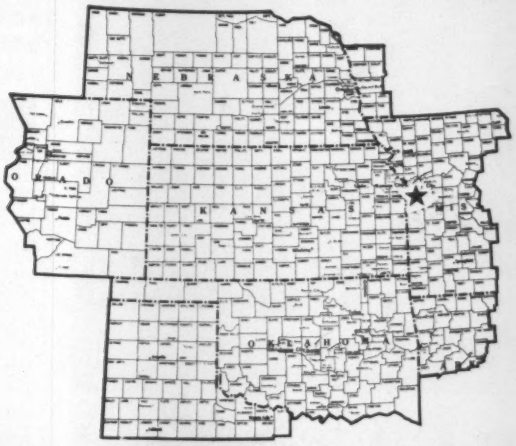
**ATLAS CAR & MFG. CO.**

Since 1896

**1100 Ivanhoe Rd. • Cleveland 10, Ohio**


K A
Kansas City
Independence
Leavenworth
Lawrence
Topeka
Ottawa
Parsons
Coffeyville
Pittsburg
Chanute
Iola
Fort Scott
Olathe
Overland Park
Prairie Village
Lee's Summit
Harrisonville
Pleasanton
Mound City
Osawatomie
Paola
Louisburg
Wellsville
Baldwin City
Eudora
Lansing
Leavenworth
Atchison
Holton
Horton
Seneca
Sabetha
Hiawatha
Troy
Oskaloosa
Perry
Valley Falls
Meriden
Rossville
Silver Lake
Topeka
Carbondale
Overbrook
Burlingame
Osage City
Pomona
Richmond
Garnett
Westphalia
Greeley
Colony
Iola
Humboldt
Chanute
Erie
Girard
Pittsburg
Frontenac
Arma
Fort Scott
Uniontown
Mapleton
Bronson
Pleasanton
Mound Valley
Cherryvale
Independence
Coffeyville
Dearing
Sedan
Caney
Havana
Peru
Edna
Chetopa
Altamont
Oswego
Parsons
Labette
Mound City
Blue Mound
Fulton
Girard
Frontenac
Arma
Mulberry
Cherokee
Columbus
Galena
Empire City
Joplin
Carthage
Webb City
Oronogo
Duenweg
Carterville
Sarcoxie
Pierce City
Monett
Cassville
Exeter
Seligman
Aurora
Marionville
Purdy
Republic
Springfield
Ozark
Nixa
Willard
Battlefield
Strafford
Rogersville
Fordland
Seymour
Mansfield
Norwood
Hartville
Ava
Gainesville
Bolivar
Fair Grove
Walnut Grove
Buffalo
Dadeville
Greenfield
Lockwood
Stockton
Golden City
Jerico Springs
Liberal
Sheldon
Lamar
Nevada
Rich Hill
Butler
Adrian
Drexel
Archie
Freeman
Belton
Raymore
Peculiar
Harrisonville
Garden City
Holden
Warrensburg
Knob Noster
Sedalia
Smithton
Dresden
Green Ridge
Versailles
Tipton
Otterville
Boonville
Arrow Rock
Marshall
Malta Bend
Slater
Sweet Springs
Mexico
Vandalia
Laddonia
Bowling Green
Louisiana
Clarksville
Cuivre
Troy
Wentzville
Lake Saint Louis
O'Fallon
Saint Charles
Saint Peters
Florissant
Ferguson
Jennings
Normandy
Pine Lawn
Berkeley
Kinloch
Bellefontaine Neighbors
Hazelwood
Overland
Maplewood
Richmond Heights
Clayton
University City
Webster Groves
Kirkwood
Glendale
Crestwood
Sunset Hills
Valley Park
Manchester
Ballwin
Chesterfield
Wildwood
Eureka
Pacific
Saint Clair
Union
Washington
Hermann
Owensville
Gasconade
Rolla
Saint James
Cuba
Sullivan
Steelville
Salem
Houston
Licking
Summersville
Mountain View
Willow Springs
West Plains
Thayer
Alton
Koshkonong
Eminence
Van Buren
Doniphan
Poplar Bluff
Piedmont
Ellington
Centerville
Fredericktown
Farmington
Park Hills
Bonne Terre
Desloge
Leadwood
Flat River
Saint Francois
Ironton
Arcadia
Pilot Knob
Belleview
Caledonia
Potosi
Mineral Point
Old Mines
Cadet
Richwoods
Bismarck
Irondale
Middle Brook
Saint Mary
Perryville
Altenburg
Uniontown
Cape Girardeau
Jackson
Scott City
Sikeston
Morehouse
New Madrid
Portageville
Caruthersville
Hayti
Kennett
Malden
Dexter
Puxico
Doniphan
Ellsinore
Grandin
Naylor
Gatewood
Thomasville
Alton
West Plains
Willow Springs
Mountain View
Summersville
Licking
Houston
Salem
Steelville
Cuba
Saint James
Rolla
Gasconade
Owensville
Hermann
Washington
Union
Pacific
Saint Clair
Eureka
Wildwood
Chesterfield
Ballwin
Manchester
Valley Park
Sunset Hills
Crestwood
Glendale
Kirkwood
Webster Groves
University City
Clayton
Richmond Heights
Maplewood
Overland
Hazelwood
Bellefontaine Neighbors
Kinloch
Berkeley
Pine Lawn
Normandy
Jennings
Ferguson
Florissant
Saint Peters
Saint Charles
O'Fallon
Lake Saint Louis
Wentzville
Troy
Cuivre
Clarksville
Louisiana
Bowling Green
Vandalia
Laddonia
Mexico
Sweet Springs
Malta Bend
Slater
Marshall
Arrow Rock
Boonville
Otterville
Tipton
Versailles
Green Ridge
Dresden
Smithton
Sedalia
Knob Noster
Warrensburg
Holden
Harrisonville
Garden City
Peculiar
Raymore
Belton
Freeman
Archie
Drexel
Adrian
Butler
Rich Hill
Nevada
Lamar
Liberal
Jerico Springs
Golden City
Lockwood
Stockton
Greenfield
Lamar
Carthage
Joplin
Empire City
Duenweg
Oronogo
Webb City
Carterville
Sarcoxie
Monett
Pierce City
Cassville
Exeter
Seligman
Aurora
Marionville
Purdy
Republic
Springfield
Ozark
Nixa
Willard
Battlefield
Strafford
Rogersville
Fordland
Seymour
Mansfield
Norwood
Hartville
Ava
Gainesville
Bolivar
Fair Grove
Walnut Grove
Buffalo
Dadeville
Greenfield
Lockwood
Stockton
Golden City
Jerico Springs
Liberal
Sheldon
Lamar
Nevada
Rich Hill
Butler
Adrian
Drexel
Archie
Freeman
Belton
Raymore
Peculiar
Harrisonville
Garden City
Holden
Warrensburg
Knob Noster
Sedalia
Smithton
Dresden
Green Ridge
Versailles
Tipton
Otterville
Boonville
Arrow Rock
Marshall
Malta Bend
Slater
Sweet Springs
Mexico
Vandalia
Laddonia
Bowling Green
Louisiana
Clarksville
Cuivre
Troy
Wentzville
Lake Saint Louis
O'Fallon
Saint Charles
Saint Peters
Florissant
Ferguson
Jennings
Normandy
Pine Lawn
Berkeley
Kinloch
Bellefontaine Neighbors
Hazelwood
Overland
Maplewood
Richmond Heights
Clayton
University City
Webster Groves
Kirkwood
Glendale
Crestwood
Sunset Hills
Valley Park
Manchester
Ballwin
Chesterfield
Wildwood
Eureka
Pacific
Saint Clair
Union
Washington
Hermann
Owensville
Gasconade
Rolla
Saint James
Cuba
Sullivan
Steelville
Salem
Houston
Licking
Summersville
Mountain View
Willow Springs
West Plains
Thayer
Alton
Koshkonong
Eminence
Van Buren
Doniphan
Poplar Bluff
Piedmont
Ellington
Centerville
Fredericktown
Farmington
Park Hills
Bonne Terre
Desloge
Leadwood
Flat River
Saint Francois
Ironton
Arcadia
Pilot Knob
Belleview
Caledonia
Potosi
Mineral Point
Old Mines
Cadet
Richwoods
Bismarck
Irondale
Middle Brook
Saint Mary
Perryville
Altenburg
Uniontown
Cape Girardeau
Jackson
Scott City
Sikeston
Morehouse
New Madrid
Portageville
Caruthersville
Hayti
Kennett
Malden
Dexter
Puxico
Doniphan
Ellsinore
Grandin
Naylor
Gatewood
Thomasville

*67 years of service to the Industrial Middle West*




# INLAND STEEL IS HERE

This . . . is a sweeping territory. It embraces the Panhandle and the northern plains of Texas—the rolling hills of western Missouri—the limitless vistas of Oklahoma, the golden fields of Nebraska and Kansas, Denver and even a corner of Arkansas. Within its boundaries lie cities and towns whose names made pioneering history. Here, is the Eisenhower Museum and the Truman Library, John Brown's cabin and the grave of Buffalo Bill. Here the Pony Express was born. Here, immense herds of cattle pounded through to northern markets. Here, the Indian watched the coming of the white man—and here, man learned to conquer the ravages of merciless windstorms and the devastation of the dust bowl.

Today this is a land of gushing oil and a tremendous oil industry, richly producing farms and a vigorous business life. Today, the area erects great bridges, oil derricks, storage tanks, corn cribs, grain bins and driers; produces culverts, electronic pumping equipment, trailers, tandems, sucker rods, and pipe to span a nation. Today the territory's farming methods have changed from the power of horses to the thundering horsepower of modern farm machinery.

*One of a series depicting market areas served by Inland · Art by Don Neske*

And today, Inland feeds steel and more steel into the ever-hungry maw of this amazingly expanding territory.

To the thousands of businessmen and industrialists throughout the territory, Inland is an old friend—a name as familiar as one's next-door neighbor. For Inland has been *here* for all these many years—growing as the territory's industries developed—contributing its knowledge and experience—sharing in the life of the territory.

Now . . . Inland experience—bred, developed and tested in the very states which make up this vast territory—is at the service of every manufacturer. For Inland is more than a name—more than a source of steel. Inland is a living part of each of these states. Their growth is Inland's growth. Their future is Inland's, too.

## INLAND STEEL COMPANY

30 West Monroe Street Chicago 3, Illinois

***Sales Offices:*** Chicago • Davenport • Detroit • Houston • Indianapolis Kansas City • Milwaukee • New York • St. Louis • St. Paul

***Other Members of the Inland Family:*** Joseph T. Ryerson & Son, Inc. • Inland Steel Products Company • Inland Steel Container Company* • Inland Lime & Stone Company*

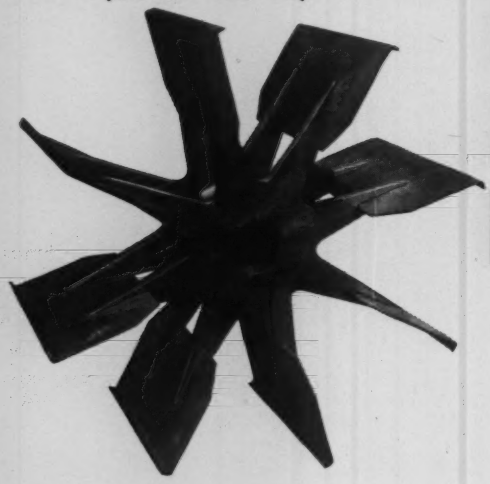
**Division*

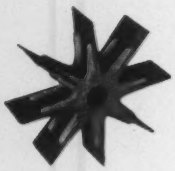
INLAND

# HT ALLOY FANS

**(15 Cr—35 Ni)**

## for Lindberg Furnaces





DURALOY

***128 pound Fan, Conventionally Cast with Blades Set in the Mold before Pouring.***

DURASHELL

***21 pound Fan, Shell Molded, Single Casting.***

Lindberg Engineering Company uses a considerable number of Duraloy castings such as these in its line of heat-treating furnaces.

These two fans, used for circulating products of combustion, have been alloyed to meet temperatures ranging from 1600 to 1950°F. While these two particular castings were shipped rough cast, we have complete machine shop facilities for finishing castings to any degree desired.

Lindberg also purchases many of our HOM castings good for temperatures up to 2200°F.

Perhaps you would like to know more about the Duraloy experience, equipment and facilities in the field of high alloys. Send for our general catalog and if at the moment you have any casting requirements, we'll be glad to discuss them and quote. Our experience in this highly specialized field goes back 40 years.

ALLOY CASTING INSTITUTE ACI MEMBER

The DURALOY Company

OFFICE AND PLANT: Scottdale, Pa.
EASTERN OFFICE: 12 East 41st Street, New York 17, N. Y.
CHICAGO OFFICE: 332 South Michigan Avenue
DETROIT OFFICE: 23908 Woodward Avenue, Pleasant Ridge, Mich.


## NEW EQUIPMENT

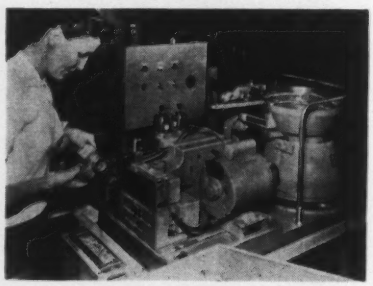
versatile, it's a crane that is completely collapsible. Thus, you can load it onto a pair of platform

trucks and move it around. Several independent units make up the complete assembly in such a way that each section may be used individually when desired. In addition, the platform raises and lowers with all equipment on it. This feature makes it a real timesaver. (W. B. McGuire Engineering Co., Ltd.)

**For more data circle No. 76 on postcard, p. 119**

### Inserts Set Screws

This fully-automatic machine inserts and drives set screws at rates up to 2500 per hour. That's one screw every 1½ seconds. And, it adapts to the cycle of other machines in an assembly line. Drilling and tapping, for instance, combine with set-screw driving to form one complete automated operation. In a typical application, the new screw-



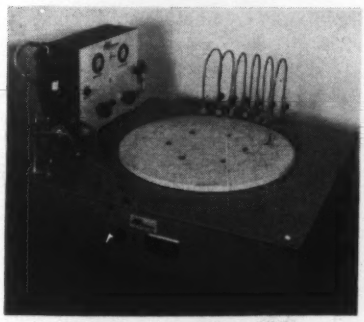
driving machine saved $1500 the first year. The job was driving square setscrews (length the same as diameter) into pipe fittings. Square sets are a tough proposition

to orient properly for automatic insertion. But this machine licked the production bottleneck and speeded shipments by 30 pct, despite a 20-pct gain on overall order volume. (Standard Pressed Steel Co.)

**For more data circle No. 77 on postcard, p. 119**

## Rotary Tables

Standard rotary tables and indexing tables are now available for automatic or semi-automatic soldering and brazing operations using the company's paste method. The machines come complete with paste applicator, natural gas and air burners, and motor-driven or air-operated tables. The tables feature a ceramic table top three feet in diameter, mounted on rugged steel frames. They are ready to go except for fixtures to hold and load the parts onto the table. These tables can handle up to 200 lb. (Fusion Engineering)



**For more data circle No. 78 on postcard, p. 119**

## Boasts Reliability

For miniature work, a new addition to the internal grinding field has a minimum of moving parts. This means there is less to go wrong. Also, careful engineering design upgrades accuracy and speeds the work. For instance, incremental wheel compensation is infinite throughout a range from 0-0.001. This sensitivity improves wheel life. In addition, a direct-reading digital dial shows the amount of wheel life remaining. Thus, the operator can anticipate the time of the wheel change. This means he's free to attend other machines. There's built-in accuracy, too. The vibration-damped, feeding cross slide

flux stays put...
air stays out!

smoother welds every time when back-up tool is glass cloth

TAPES FROM 3M

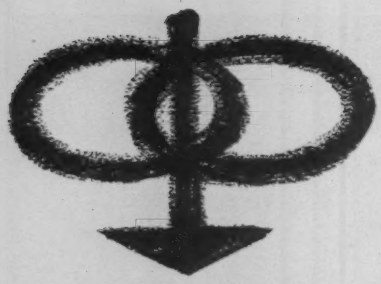
As a back-up material in submerged arc welding operations, "Scotch" Brand Glass Cloth Tape holds flux in . . . keeps unwanted air out. Tape adheres instantly to underside of girth or longitudinal seams for butt, double V and fillet type welds. Its use overcomes need for expensive jigging or other cumbersome back-up methods used to prevent burnout.

TRY THIS METHOD. See how it minimizes your flux waste and clean-up costs. Ask your 3M Representative or nearest "Scotch" Brand Tape Distributor for a demonstration, or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn. Dept. IBU-61.

SCOTCH BRAND
tapes for industry

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.



**NEWCO**

wire
in
**special shapes**

can be made to meet your most exacting requirements. Whatever your needs in carbon or alloy steel wire, it is a good idea to get a quote from NEWCO.

- **untempered**
- **oil tempered**
- **annealed**

**NEW ENGLAND HIGH CARBON WIRE CORP.**

MILLBURY, MASSACHUSETTS

**Offices and warehouses:** Cleveland, Detroit, Los Angeles, Melrose Park (Chicago) and Millbury

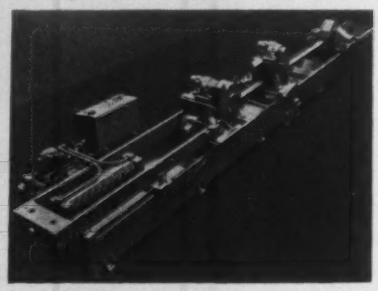



moves on anti-friction ways and provides constant repeatability. (The Heald Machine Co.)

**For more data circle No. 79 on postcard, p. 119**

## Stretcher-Twister

Aircraft and similar spar sections can now be shaped under the most precise control, thanks to this

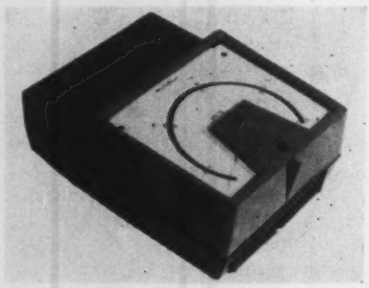


hydraulic stretching and twisting machine. The equipment has a 400,000-lb stretching capacity and a 200,000 ft-lb torque capacity. The stretching speed is infinitely variable up to 25 ipm, while twisting is performed at the rate of ¼ rpm. Precise scales indicate longitudinal headstock travel and rotary twisting movements. An outstanding feature is the intermediate head, which moves along the entire bed so that it will engage at any point of the spar. (Loma Machine Mfg. Co., Inc.)

**For more data circle No. 80 on postcard, p. 119**

## Portable Instruments

Portable ac and dc ammeters and voltmeters feature taut-band suspension mechanisms free of friction. The moving element of this taut-

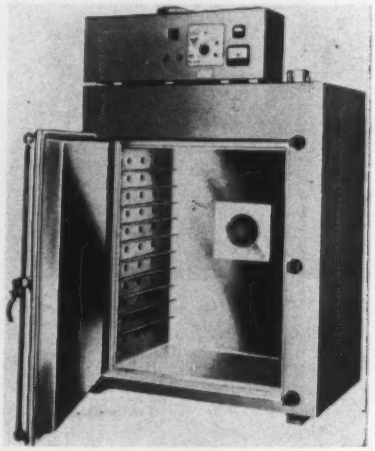


band system hangs between bands of high-strength metal ribbon which are supported by springs at each end. Since friction is eliminated, there is no wear between moving parts. This means goodby to costly upkeep. Also, these portable instruments withstand rough handling because there are no delicate pivots or jewels to crack and wear. (Westinghouse Electric Corp.)

**For more data circle No. 81 on postcard, p. 119**

## Industrial Batch Ovens

With saturable-reactor control and range-lock protection, new industrial ovens come in four sizes: 16-36 cu ft. Straight-line temperature control, without cycling action, is built into the line. And the units sustain their controlled temperature for the unusual length of time required by test procedures in the electronics industry. In addition to handling aging, curing, drying and tempering jobs, the furnaces bake coils and armatures. Preheating



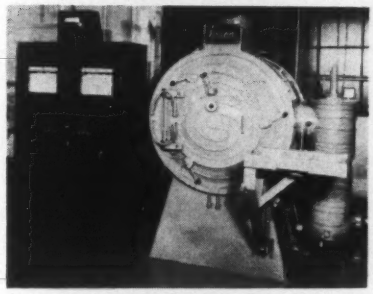
plastics, core baking, and transformer tests are still other uses. (Blue M Electric Co.)

**For more data circle No. 82 on postcard, p. 119**

## Heat Treating Furnace

Fast heating up to 2400°F, coupled with fast cooling, is possible in a new high-vacuum, heat-treating unit. The furnace hardens high speed, brazes stainless, and anneals refractory metals and special alloys. Total working floor space is 10 x 12 ft. To operate the unit, the work load is placed in a basket on the charging platform. Then the operator manually opens the door, swings the loading platform into position in front of the

unit and pushes the work basket into the furnace. The platform is then swung aside and the furnace

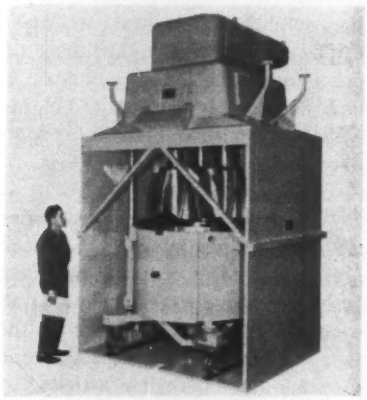


door sealed. At the control cabinet, the operator sets the time for a preheat soak and high-heat soak. After pressing the start button, the unit will automatically perform all functions. Upon completion of the last cycle, a bell rings to signal the operator. (Ipsen Industries, Inc.)

**For more data circle No. 83 on postcard, p. 119**

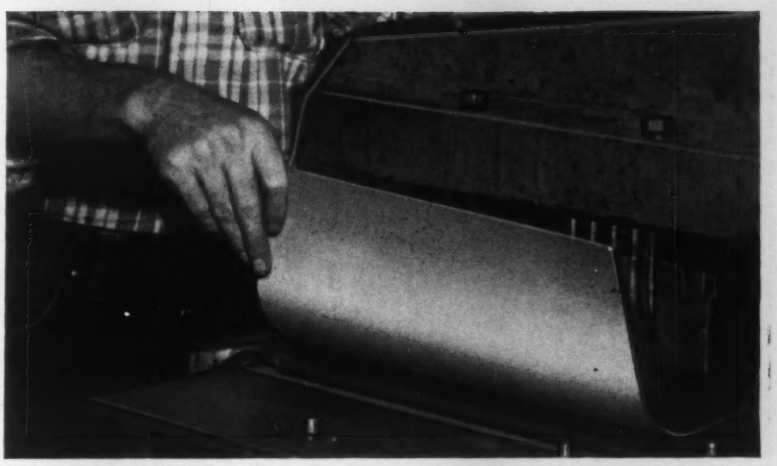
## Mixes Solid Fuels

Keeping pace with the space age, a new vertical mixer processes solid rocket propellants. Three vertical agitators overlap and intermesh to produce the intense shearing, tearing and kneading actions necessary for highly-accurate product dispersions. Here's how it's done. A 4-wing agitator rotates in the center area of the mixing bowl. Orbiting around this agitator and rotating at twice its speed are two, 2-wing agitators. These helical blades constantly move the mix from top to bottom. This prevents product strat-

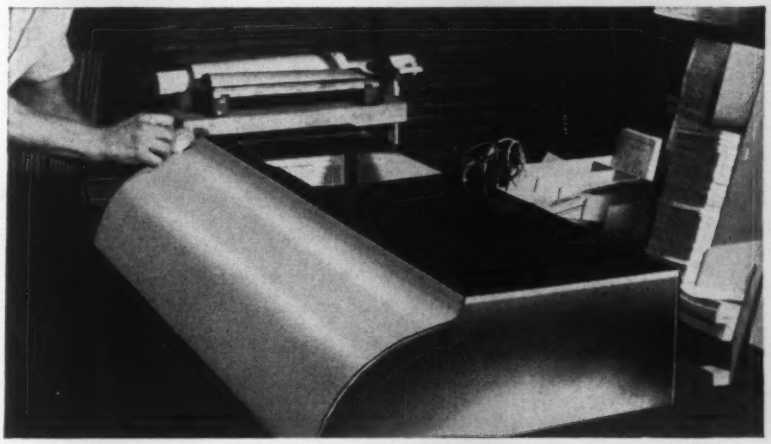


ification. (J. H. Day Co., div. of The Cleveland Automatic Machine Co.)

**For more data circle No. 84 on postcard, p. 119**

from die to delivery with no repolishing!



metal formed without a scratch when covered with protective

TAPES FROM 3M

Now you can stamp, blank or fabricate highly polished metals by first covering the area to be worked with "Scotch" Brand Protective Tape. Even light draws may be made without die-marking the finished surface. Nor is repolishing necessary. On most products, the tape can even stay-put up to point of use.

TRY THIS METHOD. See for yourself how "Scotch" Brand Protective Tapes save both time and rejects in your plant. Ask your nearest "Scotch" Brand Tape Distributor to show you how, or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn. Dept. IBU-61.

SCOTCH BRAND tapes for industry

Minnesota Mining and Manufacturing Company ...where research is the key to tomorrow

3M

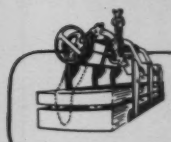
"Scotch" is a registered trademark of 3M Co., St. Paul 6, Minn.

1 man ...handles Sheet Steel Faster, Easier with a

C-F LIFTER

C-F Lifters, under one man operation, pick up, carry and unload more sheet steel tonnage per hour than any other method – and at lower cost per ton. Wide carrying angles hold sheets securely – won't damage high grade sheets; tong action insures safe carrying; fast opening and closing adjustments of Lifter jaws permit shifting from one size pack to another in seconds. C-F Lifters are made in standard or semi-special models to handle from 2 to 60 tons.

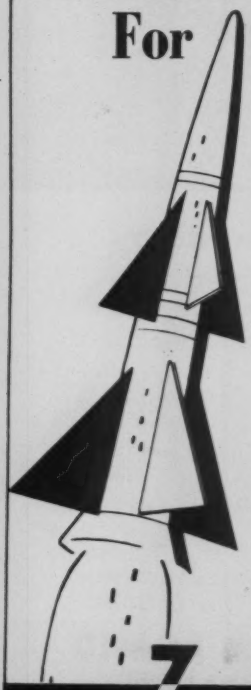
*Write for Bulletin SL-28 for specific examples of C-F Lifter operation and economy.*



CULLEN-FRIESTEDT CO.
1303 SOUTH KILBOURN AVENUE • CHICAGO 23, ILLINOIS



For metals going places



we offer VACUUM EQUIPMENT...

...for special applications in melting, annealing and processing. Production or research.

- Vacuum Arc Furnaces
- Copper Vacuum Crucibles (with interpenetrated copper welds)*
- Vacuum or Controlled Atmosphere Chambers
- Ingot Molds (Steel and Copper)
- Skull Molds
- Zak Button Furnaces

*Standard procedure at Zak

Service department for repairing of crucibles, ingot molds and furnace parts damaged in handling mishaps or other causes—

...Certified "In Plant" testing for pump down and leak rate.

PHONE TROY ARsenal 3-3912

*"Engineering Manufacturers for Industry"*

ZAK MACHINE WORKS INC.
TROY (GREEN ISLAND) N. Y.


## NEW BOOKS

**"Welding Rocket Motor Cases"** guides the welding engineer in obtaining the consistent quality and reliability necessary for this application. It covers four areas: Materials, design, welding and quality assurance. Prepared by the Missiles and Rockets Welded Fabrication Committee, it is the first national publication on the subject. The welding requirement for rocket-motor cases is perfection, and this volume recommends and describes techniques to make this objective a reality. Many useful tables present the standards for acceptance for radiographic inspection, mechanical testing, visual inspection and other methods of assuring the best possible results. 72 pp. $2.50. American Welding Society, Technical Dept., 33 West 39th St., New York 18, N. Y.

**"ASM Review of Metal Literature, 1960, Vol. 17,"** edited by Marjorie R. Hyslop, contains 11,-903 annotations of literature appearing in engineering, scientific and industrial publications throughout the world during 1960. Included are technical reports, articles, papers and documents from journals and books. The review is divided into 20 sections. Each concerns itself with a different area of materials, process engineering or technology. In addition, the new bibliography lists the addresses of the publications. And to make things easy for the reader, there's a comprehensive subject index as well as an author index. 1342 pp. $25.00. American Society for Metals, Metals Park, Novelty, Ohio.

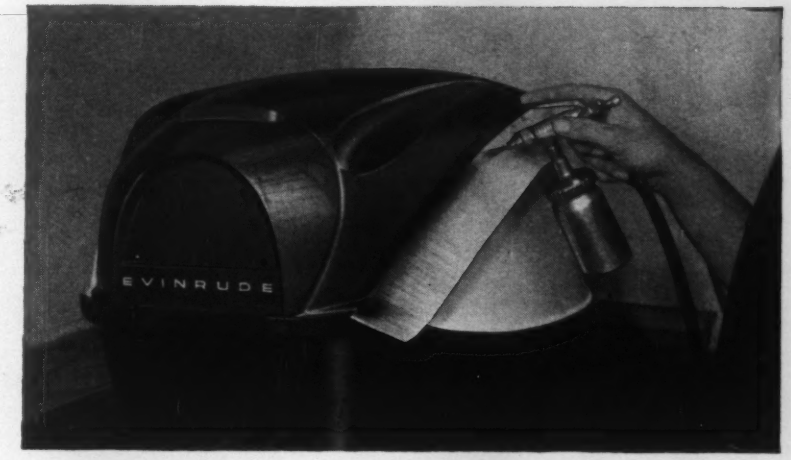
**"Progress in Non-Destructive Testing,"** edited by E. G. Stanford and J. H. Fearon, exposes the latest techniques for detecting flaws in all types of materials. Volume II (the first volume was published less than a year ago) contains articles by noted experts who evaluate the recent progress made in field. This includes relating the properties of materials to each other, and to the

factors which produce them. These authors also survey the six principal methods of flaw detection: Visual examination, penetrant testing, magnetic testing, radiography, eddy-current testing and ultrasonic testing. The book points out how risks of costly component failures may be avoided. Along the same line, it also highlights methods to improve existing operations by pretesting performance and capabilities. $12.00. The Macmillan Co., 60 5th Ave., New York 11, N. Y.

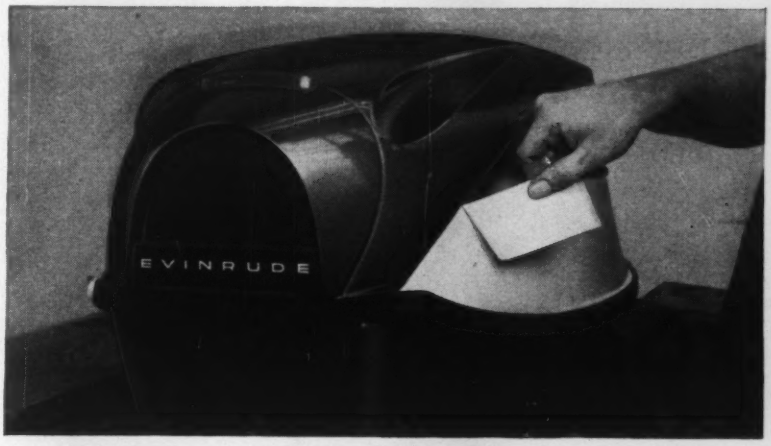
**"Engineered Castings"** by Glenn J. Cook is a comprehensive guide for the user and buyer of castings. The book is a source of broad knowledge for the design engineer as well as a reference book for foundry personnel having duties in marketing, manufacturing, and engineering. Primary emphasis is given to casting use, rather than casting production. This provides the reader with a broad understanding of and appreciation for metal castings as engineering materials.

Among the topics covered are sand molding, shell molding, investment casting, die castings, inspection and testing, vacuum casting, materials, casting designs and tolerance, and foundry selection. 257 pp. $8.50. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y.

**"Elevated Temperature Properties of Aluminum & Magnesium Alloys"** summarizes elevated temperature, tensile and creep properties of commercially-established aluminum and magnesium alloys that are normally used at high temperatures. The book is arranged for easy reference. Its full introduction explains the data presentation. Title sheets for each alloy give the alloy designation, chemical composition, and pertinent specifications under which various forms of the material are supplied. These pages are backed up by data sheets for each alloy. 308 pp. $7.00. American Society for Testing Materials Headquarters, 1916 Race St., Philadelphia 3, Pa.


final touch-up
fast and clean!




fine-line separations between colors made sharp with masking

TAPES FROM 3M

The final touch of quality for Evinrude outboard motors goes on easily and quickly with the help of masking tapes from 3M. After motor shrouds are covered with flexible shields and sprayed, separation between colors is ragged. Application of "Scotch" Brand Masking Tape and a quick final touch-up spray makes the separation sharp and clean.

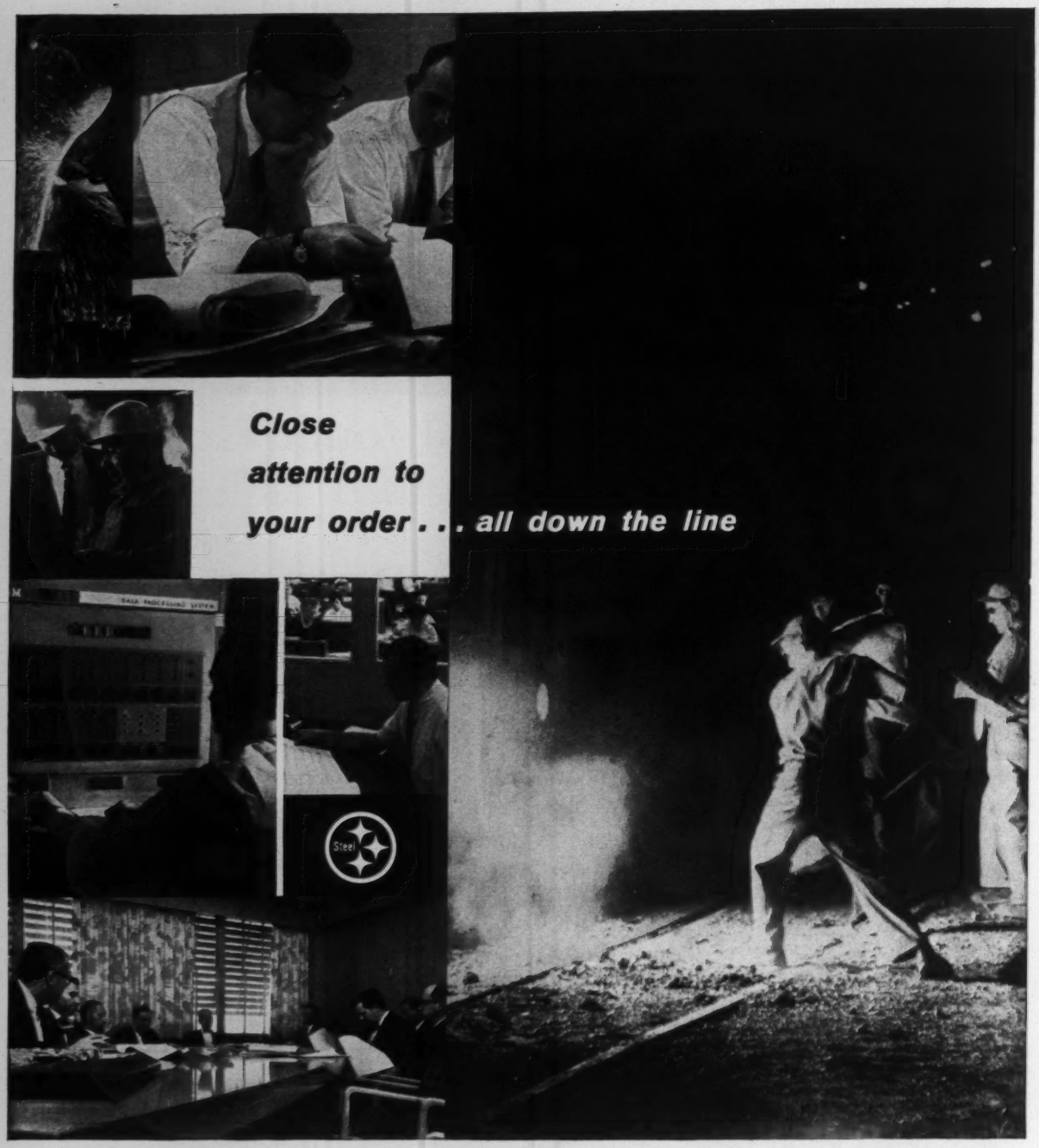
TRY THIS METHOD. See how it speeds finishing operations and improves results. Ask your 3M Representative or nearest "Scotch" Brand Tape Distributor for a demonstration, or write: 3M Co., 900 Bush Ave., St. Paul 6, Minn., Dept. IBU-61.

SCOTCH BRAND
tapes for industry

Minnesota Mining and Manufacturing Company
...where research is the key to tomorrow

3M COMPANY

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.




Alan Wood is just the right size to give your order and requirements the close attention of Alan Wood's skilled steel-men . . . all down the line. You get the advantage of young creative thinking tempered by 135 years of solid experience. Alan Wood's fully integrated operation cuts red tape, gives you uniform quality in plate, sheet and strip . . . consistently . . . and ON TIME.

***that's your advantage at* ALAN WOOD STEEL COMPANY**

**Conshohocken, Pa. • STEEL PRODUCERS WITH THE CUSTOMER IN MIND**

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia • New York • Los Angeles • Boston • Atlanta Cincinnati • Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul • San Francisco • Seattle Montreal, Toronto and Vancouver, Canada: A. C. Leslie & Co., Limited

# Buyers Give Prices a Going-Over

**Steel users are doing their best to wring concessions out of the steel companies. And they are succeeding.**

**But there's no evidence of general cuts in the base prices for basic-steel products.**

■ Major steel buyers are using every device in the purchaser's book, plus some new ones, to wring cost concessions out of steel companies.

Neither buyers nor the steel companies go so far as to call current practices price cutting. Nor are base prices of bread-and-butter steel products likely to be cut.

**By Any Other Name** — Automakers are leaders in obtaining concessions from the steel companies. But even automakers don't talk about price cuts. Instead, they refer to present buying as "analytical buying" on their part.

Not only are cost-conscious buyers exerting every ounce of pressure to get cost concessions from steel companies, but they are actively looking for more ways to use less expensive stock for different parts.

Detroit sales offices admit most of the major steel companies are involved in overgrading, such as supplying drawing quality steel at commercial quality prices.

**Staying Competitive**—How long this situation will go on depends on the strength of the market. Few mills will admit they initiate concessions themselves. But they comment that another mill will offer the concession, and they have the alternative of staying competitive, or losing out on the order.

On the overall steel market, strength continues to shape up better than May for representative mills with broad product base. July will show a dip, but looks better than expected.

**Auto Strength**—One factor behind continued strength of the market is the improved rate of auto sales. U. S. new car sales in May totaled 540,000 cars, substantially better than had been expected at the first of the month. These sales brought new car stocks down to about 902,000 at the end of May, a drop from 913,000.

More important, August tonnage now on the books is running ahead of July at a comparable point. While this tonnage is still too small to be conclusive, it indicates many users are relatively firm on their steel needs through the summer and are not likely to drop out of the market.

**Building Stocks** — Some steel service centers which expect their own sales to fall off during the summer letdown are not cutting back on their steel buying. Instead, they will use the slow period to make a mild increase in stocks of bar, sheet, and some plate sizes. This also suggests they are hopeful of a strong autumn market.

Automotive, appliance, and farm implement makers are among major users who look like much better markets this fall than a year ago.

**Orders Varied**—Actually, orders have been running ahead of consumption and some minor inventory building or "balancing" has been going on.

Depending on the mill, May orders varied from levels that would justify operating rates of from 68 to 78 pct of capacity. Variations are caused by mill location and product mix. Backlogs are building up, but will fall off this summer. They do not, at this point, justify a radical gain in steelmaking.

## District Steel Production Indexes 1957-59=100

| | Last Week | Two Weeks Ago | Month Ago | Year Ago |
|---|---|---|---|---|
| North East Coast | 102 | 104 | 105 | 97 |
| Buffalo | 108 | 119 | 120 | 89 |
| Pittsburgh | 95 | 95 | 92 | 90 |
| Youngstown | 100 | 104 | 96 | 68 |
| Cleveland | 126 | 125 | 124 | 112 |
| Detroit | 138 | 139 | 128 | 115 |
| Chicago | 115 | 115 | 106 | 97 |
| Cincinnati | 122 | 114 | 115 | 92 |
| St. Louis | 119 | 125 | 114 | 98 |
| Southern | 111 | 106 | 106 | 93 |
| Western | 124 | 119 | 127 | 106 |
| **U. S. Index** | 109.6 | 110.1 | 106.7 | 94.3 |

Source: American Iron & Steel Institute

## Steel Production, Composite Prices

| **Production** | Last Week | Two Weeks Ago | To Date 1961 | To Date 1960 |
|---|---|---|---|---|
| (Net tons, 000 Omitted) | 2,042 | 2,052 | 39,183 | 55,362 |
| **Ingot Index** | | | | |
| (1957-59=100) | 109.6 | 110.1 | 9.14 | 129.2 |
| **Composite Prices** | This Week | Week Ago | Month Ago | Year Ago |
| Finished Steel base (Cents per lb) | 6.196 | 6.196 | 6.196 | 6.196 |
| Pig Iron (Gross ton) | $66.44 | $66.44 | $66.44 | $66.41 |
| Scrap No. 1 hvy (Gross ton) | $37.83 | $37.83 | $36.50 | $31.50 |
| No. 2 bundles | $25.17 | $25.17 | $24.17 | $20.83 |

# PA: More Attention Coming

**The purchasing agent's days as a forgotten man man soon be over. Many PA's believe top management recognition is coming.**

**This is because more emphasis is being placed on the profit squeeze and materials costs.**

■ No longer a forgotten man, the company purchasing agent may get more top management attention from now on. At least this was the theme recurring time and time again at the annual convention of the National Association of Purchasing Agents in Chicago last week.

W. P. Stilwell, Univ. of Wisconsin, pointed out that 50 pct of the company sales dollar is now spent for materials. A 10 pct reduction in labor costs, he said, can produce a 25 pct rise in profits. But a 10 pct cut in materials costs can boost profits 50 pct.

Prof. Stilwell called for creation of materials management as a staff-level function. He said a materials manager of vice presidential stature would oversee the functions of purchasing, inventory control, traffic, and production planning.

**Last Frontier** — NAPA's 1960 president, Paisley Boney, noted: "It has been pretty well established that purchasing is the last frontier of business. It is the last 'gold mine' that has not been tapped. . . ."

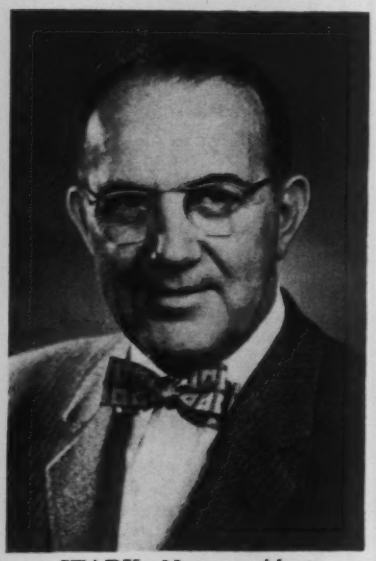
He added that "The general economic situation has already started improving. And we expect a gradual incline to continue for several years. But we also expect it to become increasingly difficult to show a profit. This fact gives purchasing its greatest opportunity to contribute to the profit picture.

"But, for purchasing to take advantage of this opportunity, we must have new ideas, techniques, and a new approach."

In a metals session moderated by Tom Campbell, Editor-in-Chief of The IRON AGE, purchasing men attending the convention were given a sweeping review of the metals outlook for this decade.

**Bigger Market** — U. S. Steel Corp.'s administrative vice president —commercial, Marcus Aurelius, indicated that steel appears to be moving toward a 140 million ton annual market by 1970. Illustrative of the revolution in steel production, he says, is the 60-in. plate mill at the Gary Works, U. S. Steel. This mill is expected to be the world's most precise in rolling plates of high tolerances.

This year, he added, will see thin tinplate, another relatively new steel product, make major entries in the container market. To the steel buyer, thin tinplate spells out an additional 400 cans of the frozen fruit juice variety for every 100 lb of tinplate purchased.



**STARK:** New president.

## Stark Elected to Top NAPA Post

Russell T. Stark, purchasing director, Burroughs Corp., is the new president of the National Assn. of Purchasing Agents. He was elected at the annual convention of NAPA in Chicago last week.

Mr. Stark is also a member of the American Management Assn., Engineering Society of Detroit, Assn. of the U. S. Army, American Ordnance Assn., and the Greater Detroit Board of Commerce.

He first joined Burroughs in 1923 in an internal traffic post. He later worked in the cost department of the United States Radiator Corp., and installed a cost system program for Baldwin Piano Co. Mr. Stark rejoined Burroughs in 1933. He became purchasing director in 1950.

The new NAPA president has also been a national director of the association and served as a regional vice president and financial officer on the executive committee.

Also elected at the convention were the new members of the association's executive committee. They include: W. P. Bray, C. S. Schrader, W. G. Watt, C. L. Maier, W. T. Naylon, D. A. Cook, G. E. Andrews, P. Boney, M. B. Eubanks, and J. J. Fogarty.

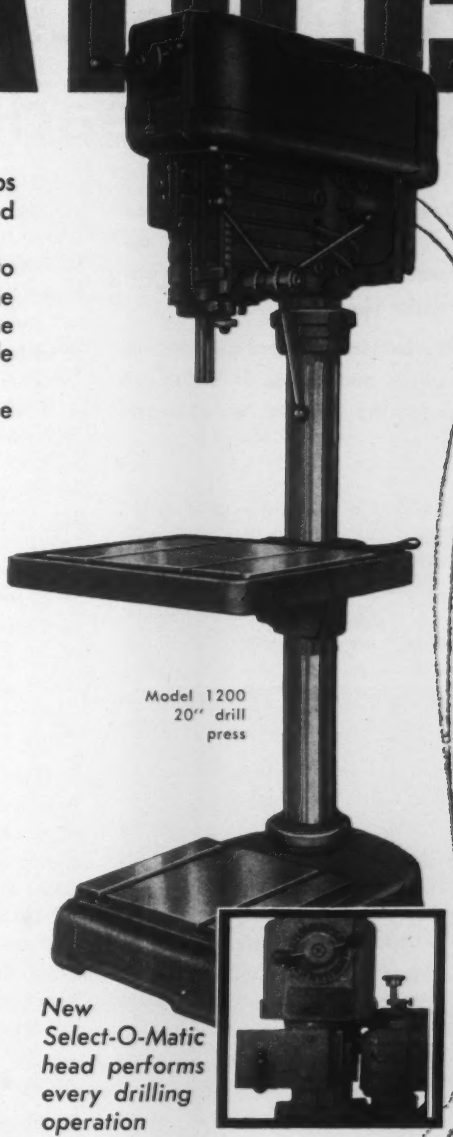
# VERSATILE

Here's the do-everything drill press that zips through any job . . . from reaming, spot-facing and tapping to polishing and high speed drilling.

Infinitely variable speed range is from 120 to 1750 RPM . . . utilizing a two-speed motor with the famous Powermatic variable speed drive. This same high-low speed system (160 to 2100 RPM) available on step-pulley model.

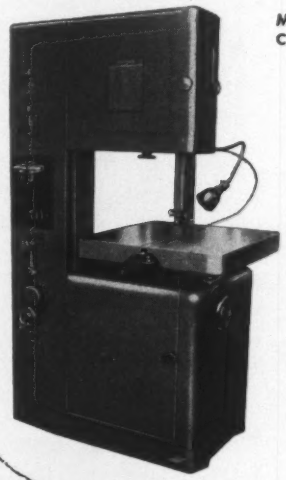
Equally safe, dependable and accurate in line production or in the smallest job shop.

- **Mechanical or Hand Feed Models**
- **Floor or Bench Units**
- **Multiple Spindle Arrangements**
- **Micrometer Depth Gauge**
- **6-spline Spindle**



Model 1200 20" drill press

*New Select-O-Matic head performs every drilling operation*



Model 87 20" Metal Cutting Band Saw

**DIAL SPEED . . . CUT COSTS SAFELY!**

Set speed from 40 to 4600 SFM while saw runs. Save stock change - over time. Ferrous and non-ferrous metals, wood, plastic and similar materials.

*Dealers in Principal Cities*

**POWERMATIC®**
**MACHINE COMPANY** Dept. 6
McMinnville, Tennessee

***BAND SAWS DRILL PRESSES GRINDERS AND FAMOUS WOODWORKING MACHINES***

**NEW, COMPLETE POWERMATIC CATALOG!**

SEND FOR YOUR FREE COPY TODAY

Name _____

Address _____

City _____ State _____

# Will Price Cutting Keep Spreading?

**Despite recent rash of price cuts, mills don't expect an across-the-board slash in products like sheet.**

**Pricing in products reduced, stainless and pipe, is different than for the general run of products.**

■ Despite the recent flurry of price cutting, reductions in products such as carbon sheet, bar, plates, shapes and tinplate are not likely.

This is the belief of steelmakers after studying the market. They accept the fact that cuts in stainless strip, some linepipe, and boosts in oil country goods discounts were brought on by a weak market.

**How They Reason**—But, at the same time, they offer some sound arguments why prices of basic steel products will hold firm. Here are some of the things they point out:

1. Prices of the tonnage products allow no margin for cutting. A recent report of Universal-Cyclops Steel Corp. gives the average price for carbon steels at $140 a ton. The stainless average is listed as $1100 a ton.

2. The dollar volume involved in standard carbon products is so great that price cuts would put some steelmakers in the red.

3. There are no distributor discounts on the standard products which can be jockeyed. The distributors operate with separate and higher price schedules. Stainless is sold to service centers at discounts of from 5 to 10 pct. The warehouse selling price is the same as the mill price to the consumer.

**Sheet and Strip** — Despite the prospect of some July slowdown in orders, most flat-rolled mills are still operating at a good pace. With this strong level of output, deliveries are holding current. For many producers June orders are running ahead of May's.

Mills at **Pittsburgh,** however, point out so far July orders are a little behind those of May and June. In the **Midwest,** mills are still getting good orders for sheet and strip from automakers. August bookings for sheet and strip are also coming in at a fairly good rate.

Flat-rolled buyers are often able to wring price concessions from mills. A great deal of this is in the form of mill overgrading. (See Summary, p. 153.)

**Galvanized**—Demand remains at high levels. Much of the large tonnage ordered by automakers is apparently earmarked for 1962 model cars. Fisher Body Co. is described as buying 52-in. sheets, which are too wide for many mills. These wide sheets are needed for undersheet material for hoods, for under fenders, and for the rear deck lid of the Corvair. Previously, zinc paint was used in these areas.

**Tinplate**—Producers are looking for a good July. Buyers are still holding off on releases and, in many cases, mills have heavy inventories. But this seems to rule against any sudden drop in tinplate demand. With user stocks low and a good crop year expected, strong third quarter mill shipments appear certain.

**Plates and Shapes**—This month will be a little better than May for many mills. But the margin is slight. It could still be wiped out by a faltering of last minute orders. Mills on the **East Coast** and at **Pittsburgh** are still getting around 40 pct of their bookings after the start of the month.

At **Cleveland,** structural mills can still make delivery in 3 to 4 weeks. In special cases, if an order can be fitted into a rolling, buyer can get shipment in 10 days.

Both plates and shapes remain on fast delivery at **Chicago** mills. But the order volume is strong.

In terms of prices, there's been some "nibbling at extra charges," according to **Pittsburgh** market sources. One purchasing agent says both mills and users "are looking more closely at this business of extras." Mills are described as more willing to discuss ways of reducing extra charges.

**Bar**—July should bring a mild interruption to the upward climb in orders. But June was one of the best months for many mills. More advance orders are coming in from users. But most buyers prefer not to order more than 30 days ahead. Rush service is still widespread.

U. S. Steel Corp. has replaced its former 10-in. No. 4 bar mill at the Gary, Ind., Works with a new 12-in. mill. The new mill is now turning out rounds in coils and cut lengths in sizes ranging from ½-in. to 1¼-in. in diameter. The move was prompted, according to USS, by the "steadily rising market demand for high quality bar stock in large size coils."

Bar flats, auto alloy spring steel flats and reinforcing bars are also produced.

**PURCHASING AGENT'S CHECKLIST**

Industry's patent rights on government-sponsored research studied. Changes likely. P. 73.

West German steel expansion slowing down. P. 80

Can computers solve production problems? Machine tool builders have interesting examples. P. 93

# COMPARISON OF PRICES

*(Effective June 13, 1961)*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

| | June 13 1961 | June 6 1961 | May 15 1961 | June 14 1960 |
|---|---|---|---|---|
| **Flat-Rolled Steel:** (per pound) | | | | |
| Hot-rolled sheets | 5.10¢ | 5.10¢ | 5.10¢ | 5.10¢ |
| Cold-rolled sheets | 6.275 | 6.275 | 6.275 | 6.275 |
| Galvanized sheets (10 ga.) | 6.875 | 6.875 | 6.875 | 6.875 |
| Hot-rolled strip | 5.10 | 5.10 | 5.10 | 5.10 |
| Cold-rolled strip | 7.425 | 7.425 | 7.425 | 7.425 |
| Plate | 5.30 | 5.30 | 5.30 | 5.30 |
| Plates, wrought iron | 14.10 | 14.10 | 14.10 | 14.10 |
| Stainl's C-R strip (No. 302) | 52.00 | 52.00 | 52.00 | 52.00 |
| **Tin and Terneplate:** (per base box) | | | | |
| Tin plates (1.50 lb.) cokes | $10.65 | $10.65 | $10.65 | $10.65 |
| Tin plates, electro (0.50 lb.) | 9.35 | 9.35 | 9.35 | 9.35 |
| Special coated mfg. ternes | 9.90 | 9.90 | 9.90 | 9.90 |
| **Bars and Shapes:** (per pound) | | | | |
| Merchants bar | 5.675¢ | 5.675¢ | 5.675¢ | 5.675¢ |
| Cold finished bar | 7.65 | 7.65 | 7.65 | 7.65 |
| Alloy bar | 6.725 | 6.725 | 6.725 | 6.725 |
| Structural shapes | 5.50 | 5.50 | 5.50 | 5.50 |
| Stainless bars (No. 302) | 46.75 | 46.75 | 46.75 | 46.75 |
| Wrought iron bars | 14.90 | 14.90 | 14.90 | 14.90 |
| **Wires:** (per pound) | | | | |
| Bright wire | 8.00¢ | 8.00¢ | 8.00¢ | 8.00¢ |
| **Rails:** (per 10 lb.) | | | | |
| Heavy rails | $5.75 | $5.75 | $5.75 | $5.75 |
| Light rails | 6.725 | 6.725 | 6.725 | 6.725 |
| **Semifinished Steel:** (per net ton) | | | | |
| Rerolling billets | $80.00 | $80.00 | $80.00 | $80.00 |
| Slabs, rerolling | 80.00 | 80.00 | 80.00 | 80.00 |
| Forging billets | 99.50 | 99.50 | 99.50 | 99.50 |
| Alloys, blooms, billets, slabs | 119.00 | 119.00 | 119.00 | 119.00 |
| **Wire Rods and Skelp:** (per pound) | | | | |
| Wire rods | 6.40¢ | 6.40¢ | 6.40¢ | 6.40¢ |
| Skelp | 5.05 | 5.05 | 5.05 | 5.05 |
| **Finished Steel Composite:** (per pound) | | | | |
| Base price | 6.196¢ | 6.196¢ | 6.196¢ | 6.196¢ |

| | June 13 1961 | June 6 1961 | May 15 1961 | June 14 1960 |
|---|---|---|---|---|
| **Pig Iron:** (per gross ton) | | | | |
| Foundry, del'd Phila. | $70.68 | $70.68 | $70.68 | $70.57 |
| Foundry, South Cin'ti. | 71.92 | 71.92 | 71.92 | 73.87 |
| Foundry, Birmingham | 62.50 | 62.50 | 62.50 | 62.50 |
| Foundry, Chicago | 66.50 | 66.50 | 66.50 | 66.50 |
| Basic, del'd Philadelphia | 70.11 | 70.11 | 70.11 | 70.07 |
| Basic, Valley furnace | 66.00 | 66.00 | 66.00 | 66.00 |
| Malleable, Chicago | 66.50 | 66.50 | 66.50 | 66.50 |
| Malleable, Valley | 66.50 | 66.50 | 66.50 | 66.50 |
| Ferromanganese 74-76 pct Mn. cents per lb.‡ | 11.00 | 11.00 | 11.00 | 11.00 |
| **Pig Iron Composite:** (per gross ton) | | | | |
| Pig iron | $66.44 | $66.44 | $66.44 | $66.41 |
| **Scrap:** (per gross ton) | | | | |
| No. 1 steel, Pittsburgh | $36.50 | $36.50 | $34.50 | $31.50 |
| No. 1 steel, Phila. area | 39.50 | 39.50 | 39.50 | 33.50 |
| No 1 steel, Chicago | 37.50 | 37.50 | 35.50 | 29.50 |
| No. 1 bundles, Detroit | 35.50* | 34.50 | 33.50 | 27.50 |
| Low phos. Youngstown | 40.50 | 40.50 | 39.50 | 34.50 |
| No. 1 mach'y cast, Pittsburgh | 45.50 | 45.50 | 45.50 | 49.50 |
| No. 1 mach'y cast, Phila. | 49.50 | 49.50 | 49.50 | 51.50 |
| No. 1 mach'y cast, Chicago | 49.50* | 48.50 | 47.50 | 46.50 |
| **Steel Scrap Composite:** (per gross ton) | | | | |
| No. 1 hvy. melting scrap | $37.83 | $37.83 | $36.50 | $31.50 |
| No. 2 bundles | 25.17 | 25.17 | 24.17 | 20.83 |
| **Coke, Connellsville:** (per net ton at oven) | | | | |
| Furnace coke, prompt | $14.75-15.50 | 14.75-15.50 | 14.75-15.50 | 14.75-15.50 |
| Foundry coke, prompt | 18.50 | 18.50 | 18.50 | 18.50 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electrolytic, Conn. | 31.00 | 31.00 | 30.00 | 33.00 |
| Copper, Lake, Conn. | 31.00 | 31.00 | 30.00 | 33.00 |
| Tin, Straits, N. Y. | 113.00† | 111.50** | 110.125 | 101.25 |
| Zinc, East St. Louis | 11.50 | 11.50 | 11.50 | 13.00 |
| Lead, St. Louis | 11.00 | 11.00 | 11.00 | 11.80 |
| Aluminum, ingot | 26.00 | 26.00 | 26.00 | 28.10 |
| Nickel, electrolytic | 74.00 | 74.00 | 74.00 | 74.00 |
| Magnesium, ingot | 36.00 | 36.00 | 36.00 | 36.00 |
| Antimony, Laredo, Tex. | 29.50 | 29.50 | 29.50 | 29.50 |

† Tentative. ‡ Average. ** Revised.

**Finished Steel Composite**

Weighted index on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

**Pig Iron Composite**

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

**Steel Scrap Composite**

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.


THE 52100 HOUSE

PETERSON STEELS, INC.

Union, N. J. • Wethersfield, Conn.
Detroit, Mich. • Melrose Park, Ill.


## INDEX TO PRICE PAGES


Prices At a Glance ..... 153
Comparison of Prices ..... 157
Bars ..... 164
Billets, Blooms and Slabs ..... 162
Boiler Tubes ..... 168
Clad Steel ..... 168
Coke ..... 167
Electrical Sheets ..... 168
Electrodes ..... 168
Electroplating Supplies ..... 168
Fasteners ..... 166
*Ferroalloys
Iron Ore ..... 166
Merchant Wire Products ..... 166
Metal Powders ..... 168
Nonferrous
Mill Products ..... 161
Primary Prices ....157, 160, 161
Remelted Metals ..... 161
Scrap ..... 161
Piling ..... 162
Pig Iron ..... 166
Pipe and Tubing ..... 167
Plates ..... 164
Rails ..... 168
Refractories ..... 168
Service Center Prices ..... 165
Shapes ..... 162
Sheets ..... 163
Spring Steel ..... 168
Stainless ..... 166
Steel Scrap ..... 159
Strip ..... 162
Structurals ..... 162
Tinplate ..... 163
Tool Steel ..... 166
Track Supplies ..... 168
Water Pipe Index ..... 167
Wire ..... 164
Wire Rod ..... 163


* Appears in the June 8-June 22 issues.


INDUCTION CONSUMABLE LEADED

PETERSON STEELS, INC.

Union, N. J. • Wethersfield, Conn.
Detroit, Mich. • Melrose Park, Ill.

# Market Starts To Level Off

**The scrap market shows signs of leveling off again. And it appears that it will remain stable through the summer.**

**Mill vacation schedules and weakened export demand have removed the recent strength.**

■ The scrap market appears to be leveling off. And the chances are good that no new major advances will come before next month, if then.

This is due to the summer vacation schedules at most mills and foundries and the model changeovers at auto plants. On top of this, export demand is weakening after an exceptionally strong second quarter.

There are no real price changes of significance this week. While most markets report continued firmness, they also report a lack of strength-in-depth. A narrow price range is expected in Pittsburgh through the summer. Cleveland and Cincinnati markets are in the doldrums just now. And Detroit reports signs of weakness.

Scrap dealers on the East Coast are hoping for continued small buys by domestic mills through the summer. This will sustain the market until fourth quarter export commitments come in.

The IRON AGE composite price for No. 1 heavy melting remains unchanged at $37.83 this week. The composite price of No. 2 bundles is also the same as last week at $25.17.

**Pittsburgh** — The market here seems to have completed its upward move. Railroad prices are following the trend established by industrial scrap and better dealer grades. On a late list, No. 1 railroad heavy melting and railroad specialties hit new higs for the current rise. However, gains were about in line with those registered by earlier lists. There is no sign of any new strength in the dealer market. A price to the dealer of $37 for No. 1 heavy melting is reportedly producing ample tonnage for current demand. There are no local buyers for No. 2 heavy melting scrap.

**Chicago**—The market held firm with minor adjustments this week. It was pegged by minor mill purchases at existing levels. New buys were expected at press time, but no new prices could be confirmed. Attempts by brokers to purchase at reduced levels had little effect on the total market strength. The prospect of seasonal July advances, plus hope of further export business, tended to hold prices firm.

**Philadelphia** — The market is steady here, but it is definitely leveling off. Export activity is slowing down. Domestic mills are in the market, but only for limited tonnage. However, some mills which hadn't bought in months made small purchases last week.

**New York** — This market continues to be steady at current levels. Dealers say it's now a day-to-day market. But scrap is continuing to move in export channels, and no one seems seriously worried. Some dealers who had been saying the next price move had to be up are now qualifying their remarks.

**Detroit** — Opinion varies on whether July industrial list prices will go up or down. This may indicate a move in either direction will not be major. Much will depend on how much scrap is generated in July. Output should be lower than June because of plant closedowns for model changeovers. This might help keep prices from falling.

**Cleveland** — The market is in mid-month doldrums with some signs of weakness cropping up. Orders for June are filled and July is expected to be somewhat slower. Mills concentrate on top grades.

**Cincinnati**—This market is also slowing down. There is no new activity expected until some time next month. Movement of scrap is good locally and there are some shipments going upriver.

**St. Louis**—Some railroad grades climbed $1 in this area. Other prices are unchanged. The feeling of strength that has prevailed here for several weeks continues.

**Birmingham**—Although activity eased off slightly this week after some lively first-of-the-month buying, the market is still steady. Brokers say they are placing orders at existing prices without difficulty.

**Buffalo**—Market continues quiet with very little activity. Shipments are going forward against small June orders. Prices are stable.

**Boston** — This is a very quiet market again this week. There is only a trickle of domestic activity and export movement is near a standstill. Prices are unchanged.

**West Coast**—On appraisal, the market moved up $2 for No. 1 and No. 2 heavy melting scrap in San Francisco, Los Angeles, and Seattle. Active exporting continues. One domestic mill entered the market for good-sized tonnage.

**Houston**—The market continues slow with very little reported activity. The district mill is still reducing inventory.

# SCRAP PRICES *(Effective June 13, 1961)*

## Iron and Steel Scrap

**Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.**

### Pittsburgh

| | |
|---|---|
| No. 1 hvy. melting | $36.00 to $37.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 dealer bundles | 37.00 to 38.00 |
| No. 1 factory bundles | 42.00 to 43.00 |
| No. 2 bundles | 25.00 to 26.00 |
| No. 1 busheling | 36.00 to 37.00 |
| Machine shop turn. | 14.00 to 15.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos. punch'gs plate | 41.00 to 42.00 |
| Heavy turnings | 31.00 to 32.00 |
| No. 1 RR hvy. melting | 40.00 to 41.00 |
| Scrap rails, random lgth. | 46.00 to 47.00 |
| Rails, 2 ft and under | 50.00 to 51.00 |
| RR specialties | 43.00 to 44.00 |
| No. 1 machinery cast. | 45.00 to 46.00 |
| Cupola cast. | 37.00 to 38.00 |
| Heavy breakable cast. | 33.00 to 34.00 |
| Stainless | |
| 18-8 bundles and solids | 180.00 to 185.00 |
| 18-8 turnings | 100.00 to 110.00 |
| 430 bundles and solids | 80.00 to 85.00 |
| 410 turnings | 55.00 to 60.00 |

### Chicago

| | |
|---|---|
| No. 1 hvy. melting | $37.00 to $38.00 |
| No. 2 hvy. melting | 31.00 to 32.00 |
| No. 1 dealer bundles | 38.00 to 39.00 |
| No. 1 factory bundles | 43.00 to 44.00 |
| No. 2 bundles | 24.00 to 25.00 |
| No. 1 busheling | 37.00 to 38.00 |
| Machine shop turn. | 16.00 to 17.00 |
| Mixed bor. and turn. | 18.00 to 19.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Cast iron borings | 18.00 to 19.00 |
| Low phos. forge crops | 45.00 to 46.00 |
| Low phos. punch'gs plate, ¼ in. and heavier | 45.00 to 46.00 |
| Low phos. 2 ft and under | 42.00 to 43.00 |
| No. 1 RR hvy. melting | 41.00 to 42.00 |
| Scrap rails, random lgth. | 47.00 to 48.00 |
| Rerolling rails | 58.00 to 60.00 |
| Rails 2 ft and under | 50.00 to 51.00 |
| Angles and splice bars | 45.00 to 46.00 |
| RR steel car axles | 59.00 to 60.00 |
| RR couplers and knuckles | 44.00 to 45.00 |
| No. 1 machinery cast. | 49.00 to 50.00 |
| Cupola cast. | 43.00 to 44.00 |
| Cast iron wheels | 35.00 to 36.00 |
| Malleable | 47.00 to 48.00 |
| Stove plate | 38.00 to 39.00 |
| Steel car wheels | 43.00 to 44.00 |
| Stainless | |
| 18-8 bundles and solids | 180.00 to 185.00 |
| 18-8 turnings | 105.00 to 110.00 |
| 430 bundles and solids | 90.00 to 95.00 |
| 430 turnings | 50.00 to 55.00 |

### Philadelphia Area

| | |
|---|---|
| No. 1 hvy. melting | $39.00 to $40.00 |
| No. 2 hvy. melting | 35.00 to 36.00 |
| No. 1 dealer bundles | 42.00 to 43.00 |
| No. 2 bundles | 25.00 to 26.00 |
| No. 1 busheling | 42.00 to 43.00 |
| Machine shop turn. | 13.00 to 14.00 |
| Mixed bor. short turn. | 16.00 to 17.00 |
| Cast iron borings | 14.00 to 15.00 |
| Shoveling turnings | 19.00 to 20.00 |
| Clean cast. chem. borings | 26.00 to 27.00 |
| Low phos. 5 ft and under | 42.00 to 43.00 |
| Low phos. 2 ft punch'gs | 44.00 to 45.00 |
| Elec. furnace bundles | 43.00 to 44.00 |
| Heavy turnings | 27.00 to 28.00 |
| RR specialties | 42.00 to 43.00 |
| Rails, 18 in. and under | 52.00 to 54.00 |
| Cupola cast. | 39.00 to 40.00 |
| Heavy breakable cast. | 39.00 to 40.00 |
| Cast iron car wheels | 40.50 to 41.50 |
| Malleable | 48.00 to 49.00 |
| No. 1 machinery cast. | 49.00 to 50.00 |

### Cincinnati

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $32.00 to $33.00 |
| No. 2 hvy. melting | 28.50 to 29.50 |
| No. 1 dealer bundles | 33.00 to 34.00 |
| No. 2 bundles | 20.00 to 21.00 |
| Machine shop turn. | 10.00 to 11.00 |
| Shoveling turnings | 13.00 to 14.00 |
| Cast iron borings | 13.00 to 14.00 |
| Low phos. 18 in. and under | 39.00 to 40.00 |
| Rails, random length | 42.00 to 43.00 |
| Rails, 18 in. and under | 46.00 to 47.00 |
| No. 1 cupola cast. | 34.00 to 35.00 |
| Heavy breakable cast. | 31.00 to 32.00 |
| Drop broken cast. | 45.00 to 46.00 |

### Youngstown

| | |
|---|---|
| No. 1 hvy. melting | $38.00 to $39.00 |
| No. 2 hvy. melting | 27.50 to 28.50 |
| No. 1 dealer bundles | 38.00 to 39.00 |
| No. 2 bundles | 24.00 to 25.00 |
| Machine shop turn. | 15.00 to 16.00 |
| Shoveling turnings | 18.00 to 19.00 |
| Low phos. plate | 40.00 to 41.00 |

### Cleveland

| | |
|---|---|
| No. 1 hvy. melting | $34.50 to $35.50 |
| No. 2 hvy. melting | 24.00 to 25.00 |
| No. 1 dealer bundles | 34.50 to 35.50 |
| No. 1 factory bundles | 38.50 to 39.50 |
| No. 2 bundles | 22.50 to 23.50 |
| No. 1 busheling | 34.50 to 35.50 |
| Machine shop turn. | 13.00 to 14.00 |
| Mixed bor. and turn. | 16.00 to 17.00 |
| Shoveling turnings | 16.00 to 17.00 |
| Cast iron borings | 16.00 to 17.00 |
| Cut structural & plates, 2 ft & under | 39.50 to 40.50 |
| Low pros. punch'gs plate | 35.50 to 36.50 |
| Drop forge flashings | 34.50 to 35.50 |
| Foundry steel, 2 ft & under | 34.00 to 35.00 |
| No. 1 RR hvy. melting | 39.00 to 40.00 |
| Rails 2 ft and under | 49.00 to 50.00 |
| Rails 18 in. and under | 49.00 to 50.00 |
| Steel axle turnings | 27.00 to 28.00 |
| Railroad cast. | 48.00 to 49.00 |
| No. 1 machinery cast. | 48.00 to 49.00 |
| Stove plate | 39.00 to 40.00 |
| Malleable | 51.00 to 52.00 |
| Stainless | |
| 18-8 bundles | 170.00 to 175.00 |
| 18-8 turnings | 100.00 to 105.00 |
| 430 bundles | 70.00 to 75.00 |

### Buffalo

| | |
|---|---|
| No. 1 hvy. melting | $31.00 to $32.00 |
| No. 2 hvy. melting | 26.00 to 27.00 |
| No. 1 busheling | 31.00 to 32.00 |
| No. 1 dealer bundles | 31.00 to 32.00 |
| No. 2 bundles | 24.00 to 25.00 |
| Machine shop turn. | 13.00 to 14.00 |
| Mixed bor. and turn. | 14.00 to 15.00 |
| Shoveling turnings | 17.00 to 18.00 |
| Cast iron borings | 15.00 to 16.00 |
| Low phos. plate | 37.00 to 38.00 |
| Structurals and plate, 2 ft and under | 39.00 to 40.00 |
| Scrap rails, random lgth. | 38.00 to 39.00 |
| Rails 2 ft and under | 48.00 to 49.00 |
| No. 1 machinery cast. | 44.00 to 45.00 |
| No. 1 cupola cast. | 38.00 to 39.00 |

### St. Louis

| | |
|---|---|
| No. 1 hvy. melting | $33.00 to $34.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| Foundry steel, 2 ft | 31.00 to 32.00 |
| No. 1 dealer bundles | 34.00 to 35.00 |
| No. 2 bundles | 23.00 to 24.00 |
| Machine shop turn. | 12.50 to 13.50 |
| Shoveling turnings | 14.50 to 15.50 |
| Cast iron borings | 21.00 to 22.00 |
| No. 1 RR hvy. melting | 37.00 to 38.00 |
| Rails, random lengths | 39.00 to 40.00 |
| Rails, 18 in. and under | 44.00 to 45.00 |
| RR specialties | 40.00 to 41.00 |
| Cupola cast. | 38.00 to 39.00 |
| Heavy breakable cast. | 32.00 to 33.00 |
| Stove plate | 32.00 to 33.00 |
| Cast iron car wheels | 34.00 to 35.00 |
| Rerolling rails | 55.00 to 56.00 |
| Unstripped motor blocks | 34.00 to 35.00 |

### Birmingham

| | |
|---|---|
| No. 1 hvy. melting | $35.00 to $36.00 |
| No. 2 hvy. melting | 29.00 to 30.00 |
| No. 1 dealer bundles | 35.00 to 36.00 |
| No. 2 bundles | 19.00 to 20.00 |
| No. 1 busheling | 38.00 to 39.00 |
| Machine shop turn. | 18.00 to 19.00 |
| Shoveling turnings | 20.00 to 21.00 |
| Cast iron borings | 10.00 to 11.00 |
| Electric furnace bundles | 38.00 to 39.00 |
| Elec. furnace, 3 ft & under | 36.00 to 37.00 |
| Bar crops and plate | 43.00 to 44.00 |
| Structural and plate, 2 ft | 42.00 to 43.00 |
| No. 1 RR hvy. melting | 37.00 to 38.00 |
| Scrap rail, random lgth. | 41.00 to 42.00 |
| Rails, 18 in. and under | 46.00 to 47.00 |
| Angles and splice bars | 43.00 to 44.00 |
| No. 1 cupola cast. | 42.00 to 43.00 |
| Stove plate | 42.00 to 43.00 |
| Cast iron car wheels | 34.00 to 35.00 |
| Unstripped motor blocks | 31.00 to 32.00 |

### New York

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $30.00 to $31.00 |
| No. 2 hvy. melting | 24.00 to 25.00 |
| No. 2 dealer bundles | 18.00 to 19.00 |
| Machine shop turnings | 5.00 to 6.00 |
| Mixed bor. and turn. | 5.00 to 6.00 |
| Shoveling turnings | 7.00 to 8.00 |
| Clean cast. chem. borings | 19.00 to 20.00 |
| No. 1 machinery cast. | 38.00 to 39.00 |
| Mixed yard cast. | 34.00 to 35.00 |
| Heavy breakable cast. | 32.00 to 33.00 |
| Stainless | |
| 18-8 prepared solids | 160.00 to 165.00 |
| 18-8 turnings | 80.00 to 85.00 |
| 430 prepared solids | 70.00 to 75.00 |
| 430 turnings | 20.00 to 25.00 |

### Detroit

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $33.00 to $34.00 |
| No. 2 hvy. melting | 28.00 to 29.00 |
| No. 1 dealer bundles | 35.00 to 36.00 |
| No. 2 bundles | 21.00 to 22.00 |
| No. 1 busheling | 32.00 to 33.00 |
| Drop forge flashings | 32.00 to 33.00 |
| Machine shop turn. | 10.00 to 11.00 |
| Mixed bor. and turn. | 12.00 to 13.00 |
| Shoveling turnings | 13.00 to 14.00 |
| Cast iron borings | 12.00 to 13.00 |
| Heavy breakable cast. | 28.00 to 29.00 |
| Mixed cupola cast. | 31.00 to 32.00 |
| Automotive cast. | 40.00 to 41.00 |
| Stainless | |
| 18-8 bundles and solids | 170.00 to 175.00 |
| 18-8 turnings | 70.00 to 75.00 |
| 430 bundles and solids | 70.00 to 75.00 |

### Boston

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | $29.00 to $30.00 |
| No. 2 hvy. melting | 24.00 to 25.00 |
| No. 1 dealer bundles | 30.00 to 31.00 |
| No. 2 bundles | 17.00 to 18.00 |
| No. 1 busheling | 30.00 to 31.00 |
| Machine shop turn. | 4.00 to 4.50 |
| Shoveling turnings | 8.50 to 9.00 |
| Clean cast. chem. borings | 14.50 to 15.50 |
| No. 1 machinery cast. | 39.00 to 40.00 |
| Mixed cupola cast. | 31.50 to 32.00 |
| Heavy breakable cast. | 28.00 to 28.50 |

### San Francisco

| | |
|---|---|
| No. 1 hvy. melting | $41.00 to $43.00 |
| No. 2 hvy. melting | 38.00 to 40.00 |
| No. 1 dealer bundles | .... 28.00 |
| No. 2 bundles | 26.00 to 27.00 |
| Machine shop turn. | .... 17.00 |
| Cast iron borings | .... 17.00 |
| No. 1 cupola cast. | 45.00 to 46.00 |

### Los Angeles

| | |
|---|---|
| No. 1 hvy. melting | $40.00 to $42.00 |
| No. 2 hvy. melting | 37.00 to 39.00 |
| No. 1 dealer bundles | .... 29.00 |
| No. 2 bundles | 25.00 to 26.00 |
| Machine shop turn. | .... 15.00 |
| Shoveling turnings | .... 15.00 |
| Cast iron borings | .... 15.00 |
| Elec. furnace 1 ft and under (foundry) | .... 50.00 |
| No. 1 cupola cast. | .... 46.00 |

### Seattle

| | |
|---|---|
| No. 1 hvy. melting | $42.00 to $44.00 |
| No. 2 hvy. melting | 38.00 to 40.00 |
| No. 2 bundles | 25.00 to 27.00 |
| No. 1 cupola cast. | .... 36.00 |
| Mixed yard cast. | .... 31.00 |

### Hamilton, Ont.

**Brokers buying prices per net ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | .... $31.00 |
| No. 2 hvy. melting cut 3 ft and under | .... 28.00 |
| No. 1 dealer bundles | .... 31.00 |
| No. 2 bundles | .... 21.00 |
| Mixed steel scrap | .... 23.00 |
| Bush., new fact., prep'd | .... 31.00 |
| Bush., new fact., unprep'd | .... 25.00 |
| Machine shop turn. | .... 8.00 |
| Short steel turn. | .... 12.00 |
| Mixed bor. and turn. | .... 12.00 |
| Cast scrap | .... 32.00 |

### Houston

**Brokers buying prices per gross ton on cars:**

| | |
|---|---|
| No. 1 hvy. melting | .... $35.00 |
| No. 2 hvy. melting | .... 31.00 |
| No. 2 bundles | .... 24.00 |
| Machine shop turn. | .... 8.00 |
| Shoveling turnings | .... 11.00 |
| Cut structural plate 2 ft & under | $45.00 to 46.00 |
| Unstripped motor blocks | 29.00 to 30.00 |
| Cupola cast. | 35.00 to 36.00 |
| Heavy breakable cast. | 29.00 to 30.00 |

# Tin Price Hits Post-Korean High

**Spot tin price of $1.12 per lb is at its highest point since the Korean War.**

**Some sellers blame speculators. And with demand increasing, traders and sellers agree the price will likely stay high.**

■ The price of spot tin in New York is passing a post-Korean War high of about $1.12 per lb.

Does this imply a shortage this year? Probably, say tin traders and sellers. But, there are some qualifications.

**Many Speculators**—Some of the recent frantic market activity has been outright speculation. Suppliers say there are many people buying and selling now who have never been in the market before.

There is no way to tell how much this has pushed up the price. But one seller figures it might be 4¢ to 6¢ per lb less, without the speculators.

**Aiming Higher**—Some tin men say speculators are actively trying to ease the price still higher.

Says one spokesman, "In May, the International Tin Council in London sent up a trial balloon. It suggested the ceiling price in the International Tin Agreement (price at which buffer stock manager must sell some of his tin on world markets) might be raised from 880 British pounds per long ton ($1.10 per lb), to 1000 British pounds per ton ($1.25 per lb).

"This balloon was shot down within the hour. Last week I believe some speculators deliberately revived this rumor, with no basis in fact, to push the price still higher."

**Judgment Day**—Traders and sellers concede that with speculation rampant, a day of retribution is sure. When the price gets as high as most speculators think it is going, there will be profit-taking. Then the sudden burst of selling is bound to push prices down.

But the general consensus is that the growing demand will keep prices from taking any very sharp drops.

**World Output**—There seems little doubt that world production of tin will not match consumption this year.

One U. S. source guesses the difference will be about 15,000 tons. President of the F.M.S. Chamber of Mines in Malaya (spokesman for Malayan tin mine operators), D. R. Mitchell, figures the difference at about 10,000 tons.

But this doesn't assure a shortage.

**Scattered Stocks** — There are stocks of tin scattered around the world that are almost sure to hit the market if prices stay or move higher. Italy, Canada and the U. S. have, and can sell quickly, almost 10,000 tons.

Canada and the U. S. would sell only to domestic customers. But this would take some demand off the world market.

**U.S. Stocks** — Also, no one is quite sure of the size of inventories of major U. S. consumers.

Most sources feel they are low. But others figure these consumers aren't in bad shape and are buying heavily now, expecting better business and a possible shortage.

No one is quite sure how much tin is in the buffer stock. A good guess wuld be close to 9000 tons. There is little doubt that this metal is moving on the market, cautiously, and will continue to be sold until prices definitely start weakening.

**Outlook Good** — Looking far-ahead, the picture is brighter. Mr. Mitchell reports that if prices stay at reasonably high levels, more higher-cost mines in Malaya will start producing.

And, while exact figures are classified, there is no doubt that the strategic stockpile in the U. S. is bulging with unneeded tin.

There are many political considerations. But there seems a good chance that if nothing else pushes prices back in reasonable areas, some of this tin will be sold. It would take six months to a year.

**Debit Factor**—Major item on the debit side of the ledger continues to be Bolivia.

Estimates that Bolivia would export 20,000 tons this year are much too high, according to U. S. sources.

## Tin Prices for the Week

June 6 — 112.25; June 7—112.375; June 8—112.625; June 9—112.875; June 12—113.00*.
*Estimate.

## Primary Prices

| (cents per lb.) | current price | last price | date of change |
|---|---|---|---|
| Aluminum Ingot | 26.00 | 24.70 | 12/17/59 |
| Copper (E) | 31.00 | 30.00 | 5/16/61 |
| Copper (CS) | 31.00 | 30.00 | 5/17/61 |
| Copper (L) | 31.00 | 30.00 | 5/17/61 |
| Lead, St. L. | 10.80 | 11.80 | 12/13/60 |
| Lead, N. Y. | 11.00 | 12.00 | 12/13/60 |
| Magnesium Ingo | 36.00 | 34.50 | 8/13/56 |
| Magnesium pig | 35.25 | 33.75 | 8/13/56 |
| Nickel | 74.00 | 64.50 | 12/6/56 |
| Titanium sponge | 150-160 | 162-182 | 8/1/59 |
| Zinc, E. St. L. | 11.50 | 12.50 | 1/12/61 |
| Zinc, N. Y. | 12.00 | 13.00 | 1/12/61 |

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 161.

## MILL PRODUCTS

*(Cents per lb unless otherwise noted)*

### ALUMINUM

*(Base 30,000 lb, f.o.b. customer's plant)*

**Flat Sheet (Mill Finish and Plate)**

*("F" temper except 6061-0)*

| Alloy | .030-.038 | .048-.061 | .077-.096 | .136-.250 |
|---|---|---|---|---|
| 1100, 3003 | 48.4 | 47.4 | 46.4 | 45.4 |
| 5052 | 55.8 | 53.0 | 50.8 | 49.2 |
| 6061-0 | 53.0 | 50.3 | 48.4 | 47.0 |

**Extruded Solid Shapes**

| Factor | 6063 T-5 | 6062 T-6 |
|---|---|---|
| 1-17 | 45.3-46.8 | 54.0-61.8 |
| 18-32 | 45.8-47.5 | 58.6-81.5 |
| 33-38 | 49.5-52.2 | 85.1-96.6 |
| 39-44 | 59.8-63.6 | 102.0-124.0 |

**Screw Machine Stock—2011-T-3**

| Size" | 7/32-5/16 | 11/32-23/32 | 3/4-1 1/16 | 1 3/32-1 3/4 |
|---|---|---|---|---|
| Price | 60.0 | 59.2 | 57.7 | 55.3 |

**Roofing Sheet, Corrugated**

(Per sheet, 26" wide base, 16,000 lb)

| Length"→ | 72 | 96 | 120 | 144 |
|---|---|---|---|---|
| .019 gage | $1.506 | $2.013 | $2.515 | $3.017 |

### MAGNESIUM

*(F.o.b. shipping pt., carload frt. allowed)*

**Sheet and Plate**

| Type↓ Gage→ | .250 3.00 | .250-2.00 | .188 | .081 | .032 |
|---|---|---|---|---|---|
| AZ31B Stand. Grade | ..... | 67.9 | 69.0 | 77.9 | 103.1 |
| AZ31B Spec. | ..... | 93.3 | 96.9 | 108.7 | 171.3 |
| Tread Plate | ..... | 70.6 | 71.7 | ..... | ..... |
| Tooling Plate | 73.0 | ..... | ..... | ..... | ..... |

**Extruded Shapes**

| factor→ | 6-8 | 12-14 | 24-26 | 36-38 |
|---|---|---|---|---|
| Comm. Grade. (AZ31C) | 65.3 | 65.3 | 66.1 | 71.5 |
| Spec. Grade... (AZ31B) | 84.6 | 85.7 | 90.6 | 104.2 |

**Alloy Ingot**

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

### NICKEL, MONEL, INCONEL

*(Base prices f.o.b. mill)*

| | "A" Nickel | Monel | Inconel |
|---|---|---|---|
| Sheet, CR | 138 | 120 | 138 |
| Strip, CR | 124 | 108 | 138 |
| Rod, bar, HR | 107 | 89 | 109 |
| Angles, HR | 107 | 89 | 109 |
| Plates, HR | 130 | 110 | 126 |
| Seamless tube | 157 | 129 | 200 |
| Shot, blocks | ... | 87 | ... |

## COPPER, BRASS, BRONZE

*(Freight included in 5000 lbs)*

| | Sheet | Wire | Rod | Tube |
|---|---|---|---|---|
| Copper | 56.13 | ..... | 53.61 | 57.32 |
| Brass, Yellow | 49.27 | 49.56 | 49.21 | 53.43 |
| Brass, Low | 52.15 | 52.44 | 52.09 | 56.21 |
| Brass, Red | 53.17 | 53.46 | 53.11 | 57.23 |
| Brass, Naval | 53.94 | 60.25 | 47.75 | 58.10 |
| Munts Metal | 51.94 | ..... | 47.25 | ..... |
| Comm. Bs. | 54.73 | 55.02 | 54.67 | 58.34 |
| Mang. Bz. | 57.71 | 61.54 | 51.27 | ..... |
| Phos. Bz. 5% | 76.97 | 76.72 | 77.47 | 78.90 |

Free Cutting Brass Rod ..... 34.77

### TITANIUM

*(Base Prices f.o.b. mill)*

Sheet and strip, commercially pure, $6.75-$13.00; alloy, $13.40-$17. Plate, HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged, commercially pure, $4.00-$4.50; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

## PRIMARY METAL

*(Cents per lb unless otherwise noted)*

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $65.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading ..... $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base .... $ 1.31
Cobalt, 97-99% (per lb) .. $1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... $29.95 to $36.95
Gold, U. S. Treas., per troy oz.... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. .... $75 to $85
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb. ..... 57.00
Mercury dollars per 76-lb flask f.o.b. New York ..... $203 to $205
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel ..... 69.60
Palladium, dollars per troy oz.. $24 to $26
Platinum, dollars per troy oz. . $82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) .... 91.375
Thorium, per kg ..... $43.00
Vanadium ..... $ 3.65
Zirconium sponge ..... $ 5.00

## REMELTED METALS

### Brass Ingot

*(Cents per lb delivered, carloads)*

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 420 ..... 30.25

### Aluminum Ingot

*(Cents per lb del'd 30,000 lb and over)*

95-5 aluminum-silicon alloys
- 0.30 copper max. ..... 23.75-24.25
- 0.60 copper max. ..... 23.50-24.00

Piston alloys (No. 132 type) .. 25.00-26.00
No. 12 alum. (No. 2 grade) .... 21.75-22.25
108 alloy ..... 22.25-22.75
195 alloy ..... 24.75-25.75
13 alloy (0.60 copper max.) .... 23.50-24.00
AXS-679 (1 pct zinc) ..... 22.00-23.00

Steel deoxidizing aluminum notch bar granulated or shot
- Grade 1—95-97½% ..... 23.25-24.25
- Grade 2—92-95% ..... 22.00-23.00
- Grade 3—90-92% ..... 21.00-22.00
- Grade 4—85-90% ..... 20.00-21.00

(Effective June 12, 1961)

## SCRAP METAL

### Brass Mill Scrap

*(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 27 | 26¼ |
| Yellow brass | 20⅜ | 18½ |
| Red brass | 23⅞ | 23⅛ |
| Comm. bronze | 24¾ | 24 |
| Mang. bronze | 19¼ | 18½ |
| Free cutting rod ends | 19½ | |

### Customs Smelters Scrap

*(Cents per pound carload lots, delivered to refinery)*

- No. 1 copper wire ..... 28¾
- No. 2 copper wire ..... 26¾
- Light copper ..... 24½
- *Refining brass ..... 25½
- Copper bearing material .... 24½

*Dry Copper content.

### Ingot Makers Scrap

*(Cents per pound carload lots, delivered to refinery)*

- No. 1 copper wire ..... 28¾
- No. 2 copper wire ..... 26¾
- Light copper ..... 24½
- No. 1 composition ..... 24
- No. 1 comp. turnings ..... 23½
- Hvy yellow brass solids .... 18½
- Brass pipe ..... 17½
- Radiators ..... 19

*Aluminum*

- Mixed old cast. ..... 12½—13
- Mixed new clips ..... 14½—15
- Mixed turnings, dry ..... 13½—14

### Dealers' Scrap

*(Dealers' buying price f.o.b. New York in cents per pound)*

**Copper and Brass**

- No. 1 copper wire ..... 25½—25¾
- No. 2 copper wire ..... 23½—23¾
- Light copper ..... 21 —21½
- Auto radiators (unsweated) . 16¾—17¼
- No. 1 composition ..... 21¼—21½
- No. 1 composition turnings.. 20¾—21
- Cocks and faucets ..... 17¼—17¾
- Clean heavy yellow brass ... 14½—15
- Brass pipe ..... 17¼—17¾
- New soft brass clippings .... 17½—18
- No. 1 brass rod turnings .... 16½—17

**Aluminum**

- Alum. pistons and struts .... 7 — 7½
- Aluminum crankcase ..... 9½—10
- 1100 (2s) aluminum clippings 12¼—12¾
- Old sheet and utensils ..... 9½—10
- Borings and turnings ..... 4½— 5
- Industrial castings ..... 10 —10½
- 2020 (24s) clippings ..... 11 —11½

**Zinc**

- New zinc clippings ..... 5½— 5¾
- Old zinc ..... 3½— 4
- Zinc routings ..... 1¾— 2
- Old die cast scrap ..... 1¾— 2

**Nickel and Monel**

- Pure nickel clippings ..... 52-54
- Clean nickel turnings ..... 40
- Nickel anodes ..... 52-54
- Nickel rod ends ..... 52-54
- New Monel clippings ..... 23-23.50
- Clean Monel turnings ..... 16.50-17
- Old sheet Monel ..... 22-23
- Nickel silver clippings, mixed. 18
- Nickel silver turnings, mixed. 15

**Lead**

- Soft scrap lead ..... 7¼— 7¾
- Battery plates (dry) ..... 3 — 3¼
- Batteries, acid free ..... 2 — 2¼

**Miscellaneous**

- Block tin ..... 81 —82
- No. 1 pewter ..... 61 —62
- Auto babbitt ..... 45 —46
- Mixed common babbitt ..... 10 —10½
- Solder joints ..... 15 —15½
- Small foundry type ..... 9 — 9½
- Monotype ..... 9¼— 9¾
- Lino. and stereotype ..... 8½— 8¾
- Electrotype ..... 8 — 8¼
- Hand picked type shells .... 5¾— 6¼
- Lino and stereo. dross ..... 1¾— 2¼
- Electro dross ..... 2½— 3

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BILLETS, BLOOMS, SLABS | | | PILING | SHAPES, STRUCTURALS | | | STRIP | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon Rerolling Net Ton | Carbon Forging Net Ton | Alloy Net Ton | Sheet Steel | Carbon | Hi Str. Low Alloy | Carbon Wide-Flange | Hot-rolled | Cold-rolled | Hi Str. H.R. Low Alloy | Hi Str. C.R. Low Alloy | Alloy Hot-rolled | Alloy Cold-rolled |
| EAST | Bethlehem, Pa. | | | $119.00 *B3* | | 5.55 *B3* | 8.10 *B3* | 5.55 *B5* | | | | | | |
| | Buffalo, N. Y. | $80.00 *R3, B3* | $99.50 *R3, B3* | $119.00 *R3, B3* | 6.50 *B3* | 5.55 *B3* | 8.10 *B3* | 5.55 *B3* | 5.10 *B3,* | 7.425 *S10, R7* | 7.575 *B3* | | | |
| | Phila., Pa. | | | | | | | | | 7.875 *P15* | | | | |
| | Harrison, N. J. | | | | | | | | | | | | | 15.55 *C11* |
| | Conshohocken, Pa. | | $99.50 *A2* | $121.00 *A2* | | | | | 5.15 *A2* | | 7.575 *A2* | | | |
| | New Bedford, Mass. | | | | | | | | | 7.875 *R6* | | | | |
| | Johnstown, Pa. | $80.00 *B3* | $99.50 *B3* | $119.00 *B3* | | 5.55 *B3* | 8.10 *B3* | | | | | | | |
| | Boston, Mass. | | | | | | | | | 7.975 *T8* | | | | 15.90 *T8* |
| | New Haven, Conn. | | | | | | | | | 7.875 *D1* | | | | |
| | Baltimore, Md. | | | | | | | | | 7.425 *T8* | | | | 15.90 *T8* |
| | Phoenixville, Pa. | | | | | 5.55 *P2* | 8.10 *P2* | 5.55 *P2* | | | | | | |
| | Sparrows Pt., Md. | | | | | | | | 5.10 *B3* | | 7.575 *B3* | | | |
| | New Britain, Wallingford, Conn. | | | $119.00 *N8* | | | | | | 7.875 *W1,S7* | | | | |
| | Pawtucket, R. I. Worcester, Mass. | | | | | | | | | 7.975 *N7, A5* | | | | 15.90 *N7* 15.70 *T8* |
| MIDDLE WEST | Alton, Ill. | | | | | | | | 5.30 *L1* | | | | | |
| | Ashland, Ky. | | | | | | | | 5.10 *A7* | | 7.575 *A7* | | | |
| | Canton-Massillon, Dover, Ohio | | $102.00 *R3* | $119.00 *R3, T5* | | | | | | 7.425 *G4* | | 10.80 *G4* | | |
| | Chicago, Franklin Park, Evanston, Ill. | $80.00 *U1, R3* | $99.50 *U1, R3,W8* | $119.00 *U1, R3,W8* | 6.50 *U1* | 5.50 *U1, W8,P13* | 8.05 *U1, Y1,W8* | 5.50 *U1* | 5.10 *W8, N4,A1* | 7.425 *A1,T8, M8* 7.525* *M8* | 7.575 *W8* | | 8.40 *W8, S9,I3* | 15.55 *A1, S9,G4,T8* |
| | Cleveland, Ohio | | | | | | | | | 7.425 *A5* | | 10.75 *A5* | 8.40 *J3* | 15.60 *N7* |
| | Detroit, Mich. | | | $119.00 *R5* | | | | | 5.10 *G3, M2* | 7.425 *M2, S1, D1, P11, B9* | 7.575 *G3* | 10.80 *S1* | | |
| | Anderson, Ind. | | | | | | | | | 7.425 *G4* | | | | |
| | Gary, Ind. Harbor, Indiana | $80.00 *U1* | $99.50 *U1* | $119.00 *U1, Y1* | | 5.50 *U1, I3, Y1* | 8.05 *U1, J3* | 5.50 *I3* | 5.10 *U1, I3,Y1* | 7.425 *Y1* | 7.575 *U1, I3,Y1* | 10.90 *Y1* | 8.40 *U1, Y1* | |
| | Sterling, Ill. | $80.00 *N4* | | | | 5.50 *N4* | 7.75 *N4* | 5.50 *N4* | 5.20 *N4* | | | | | |
| | Indianapolis, Ind. | | | | | | | | | 7.575 *R5* | | | | 15.70 *R5* |
| | Newport, Ky. | | | | | | | | 5.10 *A9* | | | | 8.40 *A9* | |
| | Niles, Warren, Struthers, Ohio Sharon, Pa. | | $99.50 *S1, C10* | $119.00 *C10,S1* | | 5.50 *Y1* | | | 5.10 *R3, S1* | 7.425 *R3, T4,S1* | 7.575 *R3, S1* | 10.80 *R3, S1* | 8.40 *S1* | 15.55 *S1* |
| | Owensboro, Ky. | $80.00 *G5* | $99.50 *G5* | $119.00 *G5* | | | | | | | | | | |
| | Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa. | $80.00 *U1, P6* | $99.50 *U1, C11,P6* | $119.00 *U1, C11,B7* | 6.50 *U1* | 5.50 *U1, J3* | 8.05 *U1, J3* | 5.50 *U1* | 5.10 *P6* | 7.425 *B4, M10* 7.525 *E3* | | | 8.40 *S9* | 15.55 *S9* 15.60 *N7* |
| | Weirton, Wheeling, Follansbee, W. Va. | | | | 6.50 *U1, W3* | 5.50 *W3* | | 5.50 *W3* | 5.10 *W3* | 7.425 *W5* | 7.575 *W3* | 10.80 *W3* | | |
| | Youngstown, Ohio | $80.00 *R3* | $99.50 *Y1, C10* | $119.00 *Y1* | | | 8.05 *Y1* | | 5.10 *U* | 7.425 *Y1,R5* | 7.575 *U1, Y1* | 10.95 *Y1* | 8.40 *U1, Y1* | 15.55 *R5, Y1* |
| WEST | Fontana, Cal. | $90.50 *K1* | $109.00 *K1* | $140.00 *K1* | | 6.30 *K1* | 8.85 *K1* | 6.45 *K1* | 5.825 *K1* | 9.20 *K1* | | | | |
| | Geneva, Utah | | $99.50 *C7* | | | 5.50 *C7* | 8.05 *C7* | | | | | | | |
| | Kansas City, Mo. | | | | | 5.60 *S2* | 8.15 *S2* | | | | | | 8.65 *S2* | |
| | Los Angeles, Torrance, Cal. | | $109.00 *B2* | $139.00 *B2* | | 6.20 *C7, B2* | 8.75 *B2* | | 5.85 *C7, B2* | 9.30 *C1,R5* | | | 9.60 *B2* | 17.75 *J3* |
| | Minnequa, Colo. | | | | | 5.80 *C6* | | | 6.20 *C6* | 9.375 *C6* | | | | |
| | Portland, Ore. | | | | | 6.25 *O2* | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | | $109.00 *B2* | | | 6.15 *B2* | 8.70 *B2* | | 5.85 *C7, B2* | | | | | |
| | Seattle, Wash. | | $109.00 *B2* | $140.00 *B2* | | 6.25 *B2* | 8.80 *B2* | | 6.10 *B2* | | | | | |
| SOUTH | Atlanta, Ga. | | | | | 5.70 *A8* | | | 5.10 *A8* | | | | | |
| | Fairfield, City, Ala. Birmingham, Ala. | $80.00 *T2* | $99.50 *T2* | | | 5.50 *T2 R3,C16* | 8.05 *T2* | | 5.10 *T2, R3,C16* | | 7.575 *T2* | | | |
| | Houston, Lone Star, Texas | | $104.50 *S2* | $124.00 *S2* | | 5.60 *S2* | 8.15 *S2* | | | | | | 8.65 *S2* | |

* Electro-galvanized-plus galvanizing extras.

(Effective June 12, 1961)

IRON AGE

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | SHEETS | | | | | | | | WIRE ROD | TINPLATE† | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-rolled *18* ga. & hvyr. | Cold-rolled | Galvanized (Hot-dipped) | Electro-galvanized | Enameling | Long Terne | Hi Str. Low Alloy H.R. | Hi Str. Low Alloy C.R. | | Cokes* *1.25*-lb. base box | Electro** *0.25*-lb. base box | Thin *0.25* lb. coating in coils |
| EAST | Buffalo, N. Y. | 5.10 *B3* | 6.275 *B3* | | | | | 7.525 *B3* | 9.275 *B3* | 6.40 *W6* | † Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢. | | Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢. |
| | Claymont, Del. | | | | | | | | | | | | |
| | Coatesville, Pa. | | | | | | | | | | | | |
| | Conshohocken, Pa. | 5.15 *A2* | 6.325 *A2* | | | | | 7.575 *A2* | | | | | |
| | Harrisburg, Pa. | | | | | | | | | | | | |
| | Hartford, Conn. | | | | | | | | | | | | |
| | Johnstown, Pa. | | | | | | | | | 6.40 *B3* | | | |
| | Fairless, Pa. | 5.15 *U1* | 6.325 *U1* | | | | | 7.575 *U1* | 9.325 *U1* | | | $9.10 *U1* | $6.25 *U1* |
| | New Haven, Conn. | | | | | | | | | | | | |
| | Phoenixville, Pa. | | | | | | | | | | | | |
| | Sparrows Pt., Md | 5.10 *B3* | 6.275 *B3* | 6.875 *B3* | | 6.775 *B3* | | 7.525 *B3* | 9.275 *B3* 10.025 *B3** | 6.50 *B3* | $10.40 *B3* | $9.10 *B3* | $6.25 *B3* |
| | Worcester, Mass. | | | | | | | | | 6.70 *A5* | | | |
| MIDDLE WEST | Alton, Ill. | | | | | | | | | 6.60 *L1* | Hollowware Enameling 29 ga.—*7.85 U1* at Gary; Pittsburgh; *J3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; *7.95 G2* at Granite City. | | |
| | Ashland, Ky. | 5.10 *A7* | | 6.875 *A7* | | 6.775 *A7* | | 7.525 *A7* | | | | | |
| | Canton-Massillon, Dover, Canfield, Ohio | | | 6.875 *R1, R3* | 7.50 *C19* | | | | | | | | |
| | Chicago, Joliet, Ill. | 5.10 *W8, A1* | | | | | | 7.525 *U1, W8* | | 6.40 *A5, R3, W8* | | | |
| | Sterling, Ill. | | | | | | | | | 6.50 *N4, K2* | | | |
| | Cleveland, Ohio | 5.10 *R3, J3* | 6.275 *R3, J3* | | 7.65 *R3* | 6.775 *R3* | | 7.525 *R3, J3* | 9.275 *R3, J3* | 6.40 *A5* | | | |
| | Detroit, Mich. | 5.10 *G3, M2* | 6.275 *G3, M2* | | | | | 7.525 *G3* | 9.275 *G3* | | | | |
| | Newport, Ky. | 5.10 *A9* | 6.275 *A9* | | | | | | | | | | |
| | Gary, Ind. Harbor, Indiana | 5.10 *U1, I3, Y1* | 6.275 *U1, I3, Y1* | 6.875 *U1, I3* | | 6.775 *U1, I3, Y1* | 7.225 *U1* | 7.525 *U1, Y1, I3* | 9.275 *U1, Y1* | 6.40 *Y1* | $10.40 *U1, Y1* | $9.10 *I3, U1, Y1* | $6.25 *U1, I3* |
| | Granite City, Ill. | 5.20 *G2* | 6.375 *G2* | 6.975 *G2* | | | | | | | | $9.20 *G2* | |
| | Kokomo, Ind. | | | 6.975 *C9* | | | | | | 6.50 *C9* | | | |
| | Mansfield, Ohio | 5.10 *E2* | 6.275 *E2* | | | | 7.225 *E2* | | | | | | |
| | Middletown, Ohio | | 6.275 *A7* | 6.875 *A7* | 7.225 *A7* | 6.775 *A7* | 7.225 *A7* | | | | | | |
| | Niles, Warren, Ohio Sharon, Pa. | 5.10 *R3, S1* | 6.275 *R3* | 6.875 *R3* | 7.65 *R3* | 6.775 *S1* | 7.225 *S1*†† *R3* | 7.525 *R3, S1* | 9.275 *R3* | | | $9.10 *R3* | |
| | Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa. | 5.10 *U1, J3, P6* | 6.275 *U1, J3, P6* | 6.875 *U1, J3* | 7.50 *E3* | 6.775 *U1* | | 7.525 *U1, J3* | 9.275 *U1, J3* 10.125 *U1, J3** | 6.40 *A5, J3, P6* | $10.40 *U1, J3* | $9.10 *U1, J3* | $6.25 *U1, J3* |
| | Portsmouth, Ohio | 5.10 *P7* | 6.275 *P7* | | | | | | | 6.40 *P7* | | | |
| | Weirton, Wheeling, Follansbee, W. Va. | 5.10 *W3, W5* | 6.275 *W3, F3, W5* | 6.875 *W3, W5* | 7.50 *W3* | | 7.225 *W5* | 7.525 *W3* | 9.275 *W3* | | $10.40 *W5, W3* | $9.10 *W5, W3* | $6.40 *W5*** $6.25 *W3* |
| | Youngstown, Ohio | 5.10 *U1, Y1* | 6.275 *Y1* | | | 6.775 *Y1* | | 7.525 *Y1* | 9.275 *Y1* | 6.40 *Y1* | | | |
| WEST | Fontana, Cal. | 5.825 *K1* | 7.40 *K1* | | | | | 8.25 *K1* | 10.40 *K1* | | $11.05 *K1* | $9.75 *K1* | |
| | Geneva, Utah | 5.20 *C7* | | | | | | | | | | | |
| | Kansas City, Mo. | | | | | | | | | 6.65 *S2* | | | |
| | Los Angeles, Torrance, Cal. | | | | | | | | | 7.20 *B2* | | | |
| | Minnequa, Colo. | | | | | | | | | 6.65 *C6* | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 5.80 *C7* | 7.225 *C7* | 7.625 *C7* | | | | | | 7.20 *C7* | $11.05 *C7* | $9.75 *C7* | |
| SOUTH | Atlanta, Ga. | | | | | | | | | | | | |
| | Fairfield, Ala. Alabama City, Ala. | 5.10 *T2, R3* | 6.275 *T2, R3* | 6.875 *T2, R3* | | 6.775 *T2* | | | | 6.40 *T2, R3* | $10.40 *T2* | $9.10 *T2* | $6.25 *T2* |
| | Houston, Texas | | | | | | | | | 6.65 *S2* | | | |

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective June 12, 1961)

# STEEL PRICES

*Italics* identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

| | | BARS | | | | | | PLATES | | | | WIRE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Carbon† Steel | Reinforcing | Cold Finished | Alloy Hot-rolled | Alloy Cold Drawn | Hi Str. H.R. Low Alloy | Carbon Steel | Floor Plate | Alloy | Hi Str. Low Alloy | Mfr'a. Bright |
| EAST | Bethlehem, Pa. | | | | 6.725 *B3* | 9.025 *B3* | 8.30 *B3* | | | | | |
| | Buffalo, N. Y. | 5.675 *R3,B3* | 5.675 *R3,B3* | 7.70 *B5* | 6.725 *B3,R3* | 9.025 *B3,B5* | 8.30 *B3* | 5.30 *B3* | | | | 8.00 *W6* |
| | Claymont, Del. | | | | | | | 5.30 *P2* | 6.375 *P2* | 7.50 *P2* | 7.95 *P2* | |
| | Coatesville, Pa. | | | | | | | 5.30 *L4* | | 7.50 *L4* | 7.95 *L4* | |
| | Conshohocken, Pa. | | | | | | | 5.30 *A2* | 6.375 *A2* | 7.50 *A2* | 7.95 *A2* | |
| | Milton, Pa. | 5.825 *M7* | 5.825 *M7* | | | | | | | | | |
| | Hartford, Conn. | | | 8.15 *R3* | | 9.325 *R3* | | | | | | |
| | Johnstown, Pa. | 5.675 *B3* | 5.675 *B3* | | 6.725 *B3* | | 8.30 *B3* | 5.30 *B3* | | 7.50 *B3* | 7.95 *B3* | 8.00 *B3* |
| | Steelton, Pa. | | 5.675 *B3* | | | | | | | | | |
| | Fairless, Pa. | 5.825 *U1* | 5.825 *U1* | | | | | | | | | |
| | Newark, Camden, N. J. | | | 8.10 *W10, P10* | | 9.20 *W10, P10* | | | | | | |
| | Bridgeport, Putnam, Willimantic, Conn. | | | 8.20 *W10* 8.15 *J3* | 6.80 *N8* | 9.175 *N8* | | | | | | |
| | Sparrows Pt., Md. | | 5.675 *B3* | | | | | 5.30 *B3* | | 7.50 *B3* | 7.95 *B3* | 8.10 *B3* |
| | Palmer, Worcester, Readville, Mansfield, Mass. | | | 8.20 *B5, C14* | | 9.325 *A5,B5* | | | | | | 8.30 *A5, W6* |
| | Spring City, Pa. | | | 8.10 *K4* | | 9.20 *K4* | | | | | | |
| MIDDLE WEST | Alton, Ill. | 5.875 *L1* | | | | | | | | | | 8.20 *L1* |
| | Ashland, Newport, Ky. | | | | | | | 5.30 *A7, A9* | | 7.50 *A9* | 7.95 *A7* | |
| | Canton, Massillon, Mansfield, Ohio | 6.15* *R3* | | 7.65 *R3,R2* | 6.725 *R3, T5* | 9.025 *R3,R2, T5* | | 5.30 *E2* | | | | |
| | Chicago, Joliet, Waukegan, Madison, Harvey, Ill. | 5.675 *U1,R3, W8,N4,P13* | 5.675 *U1,R3, N4,P13,W8* 5.875 *L1* | 7.65 *A5, W10,W8, B5,L2,N9* | 6.725 *U1,R3, W8* | 9.025 *A5, W10,W8, L2,N8,B5* | 8.30 *U1,W8, R3* | 5.30 *U1,A1, W8,I3* | 6.375 *U1* | 7.50 *U1, W8* | 7.95 *U1, W8* | 8.00 *A5,R3, W8,N4, K2,W7* |
| | Cleveland, Elyria, Ohio | 5.675 *R3* | 5.675 *R3* | 7.65 *A5,C13, C18* | | 9.025 *A5, C13,C18* | 8.30 *R3* | 5.30 *R3,J3* | 6.375 *J3* | | 7.95 *R3,J3* | 8.00 *A5, C13,C18* |
| | Detroit, Plymouth, Mich. | 5.675 *G3* | 5.675 *G3* | 7.90 *P3* 7.85 *P8B5H2* 7.65 *R5* | 6.725 *R5,G3* | 9.025 *R5,P8, H2* 9.225 *B5,P3* | 8.30 *G3* | 5.30 *G3* | | 7.50 *G3* | 7.95 *G3* | |
| | Duluth, Minn. | | | | | | | | | | | 8.00 *A5* |
| | Gary, Ind. Harbor, Crawfordsville, Hammond, Ind. | 5.675 *U1,I3, Y1* | 5.675 *U1,I3, Y1* | 7.65 *R3,J3* | 6.725 *U1,I3, Y1* | 9.025 *R3,M4* | 8.30 *U1,Y1* | 5.30 *U1,I3, Y1* | 6.375 *J3, Y1* | 7.50 *U1, Y1* | 7.95 *U1, Y1,I3* | 8.10 *M4* |
| | Granite City, Ill. | | | | | | | 5.40 *G2* | | | | |
| | Kokomo, Ind. | | 5.775 *C9* | | | | | | | | | 8.10 *C9* |
| | Sterling, Ill. | 5.775 *N4* | 5.775 *N4* | | | | 7.925 *N4* | 5.30 *N4* | | | 7.625 *N4* | 8.10 *K2* |
| | Niles, Warren, Ohio Sharon, Pa. | | | 7.65 *C10* | 6.725 *C10,* | 9.025 *C10* | | 5.30 *R3,S1* | | 7.50 *S1* | 7.95 *R3, S1* | |
| | Owensboro, Ky. | 5.675 *G5* | | | 6.725 *G5* | | | | | | | |
| | Pittsburgh, Midland, Donora, Aliquippa, Pa. | 5.675 *U1,J3* | 5.675 *U1,J3* | 7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9* | 6.725 *U1,J3, C11,B7* | 9.025 *A5, W10,R3,S9, C11,C8,M9* | 8.30 *U1,J3* | 5.30 *U1,J3* | 6.375 *U1,J3* | 7.50 *U1, J3,B7* | 7.95 *U1, J3,B7* | 8.00 *A5, J3,P6* |
| | Portsmouth, Ohio | | | | | | | | | | | 8.00 *P7* |
| | Youngstown, Steubenville, O. | 5.675 *U1,R3, Y1* | 5.675 *U1,R3, Y1* | 7.65 *A1,Y1, F2* | 6.725 *U1,Y1* | 9.025 *Y1,F2* | 8.30 *U1,Y1* | 5.30 *U1,W5, R3,Y1* | | 7.50 *Y1* | 7.95 *U1,Y1* | 8.00 *Y1* |
| WEST | Emeryville, Fontana, Cal. | 6.425 *J5* 6.375 *K1* | 6.425 *J5* 6.375 *K1* | | 7.775 *K1* | | 9.00 *K1* | 6.10 *K1* | | 8.30 *K1* | 8.75 *K1* | |
| | Geneva, Utah | | | | | | | 5.30 *C7* | | | 7.95 *C7* | |
| | Kansas City, Mo. | 5.925 *S2* | 5.675 *S2* | | 6.975 *S2* | | 8.55 *S2* | | | | | 8.25 *S2* |
| | Los Angeles, Torrance, Cal. | 6.375 *C7,B2* | 6.375 *C7,B2* | 9.10 *R3,P14, S12* | 7.775 *B2* | 11.00 *P14, B5* | 9.00 *B2* | | | | | 8.95 *B2* |
| | Minnequa, Colo. | 6.125 *C6* | 6.125 *C6* | | | | | 6.15 *C6* | | | | 8.25 *C6* |
| | Portland, Ore. | 6.425 *O2* | 6.425 *O2* | | | | | | | | | |
| | San Francisco, Niles, Pittsburg, Cal. | 6.375 *C7* 6.425 *B2* | 6.375 *C7* 6.425 *B2* | | | | 9.05 *B2* | | | | | 8.95 *C7,C6* |
| | Seattle, Wash. | 6.425 *B2,N6, A10* | 6.425 *B2,A10* | | 7.825 *B2* | | 9.05 *B2* | 6.20 *B2* | | 8.40 *B2* | 8.85 *B2* | |
| SOUTH | Atlanta, Ga. Jacksonville, Fla. | 5.875 *A8* | 5.00 *A8* | | | | | | | | | 8.00 *A8* 8.35 *M4* |
| | Fairfield City, Ala. Birmingham, Ala. | 5.675 *T2,R3, C16* | 5.675 *T2,R3, C16* | 8.25 *C16* | | | 8.30 *T2* | 5.30 *T2,R3* | | | 7.95 *T2* | 8.00 *T2,R3* |
| | Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla. | 5.925 *S2* | 5.675 *S2* | | 6.975 *S2* | | 8.55 *S2* | 5.40 *S2* | | 7.60 *S2* | 8.05 *S2* | 8.25 *S2* |

† Merchant Quality—Special Quality 35¢ higher. (Effective June 12, 1961) * Special Quality.

# STEEL PRICES

## Key to Steel Producers

### With Principal Offices

*A1* Acme Steel Co., Chicago
*A2* Alan Wood Steel Co., Conshohocken, Pa.
*A3* Allegheny Ludlum Steel Corp., Pittsburgh
*A4* American Cladmetals Co., Carnegie, Pa.
*A5* American Steel & Wire Div., Cleveland
*A6* Angel Nail & Chaplet Co., Cleveland
*A7* Armco Steel Corp., Middletown, Ohio
*A8* Atlantic Steel Co., Atlanta, Ga.
*A9* Acme-Newport Steel Co., Newport, Ky.
*A10* Alaska Steel Mills, Inc., Seattle, Wash.

*B1* Babcock & Wilcox Tube Div., Beaver Falls, Pa.
*B2* Bethlehem Steel Co., Pacific Coast Div.
*B3* Bethlehem Steel Co., Bethlehem, Pa.
*B4* Blair Strip Steel Co., New Castle, Pa.
*B5* Bliss & Laughlin, Inc., Harvey, Ill.
*B6* Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
*B7* A. M. Byers, Pittsburgh
*B8* Braeburn Alloy Steel Corp., Braeburn, Pa.
*B9* Barry Universal Corp., Detroit, Mich.

*C1* Calstrip Steel Corp., Los Angeles
*C2* Carpenter Steel Co., Reading, Pa.
*C6* Colorado Fuel & Iron Corp., Denver
*C7* Columbia Geneva Steel Div., San Francisco
*C8* Columbia Steel & Shafting Co., Pittsburgh
*C9* Continental Steel Corp., Kokomo, Ind.
*C10* Copperweld Steel Co., Pittsburgh, Pa.
*C11* Crucible Steel Co. of America, Pittsburgh
*C13* Cuyahoga Steel & Wire Co., Cleveland
*C14* Compressed Steel Shafting Co., Readville, Mass.
*C15* G. O. Carlson, Inc., Thorndale, Pa.
*C16* Connors Steel Div., Birmingham
*C18* Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
*C19* Canfield Steel Co., Canfield, O.

*D1* Detroit Steel Corp., Detroit
*D2* Driver, Wilbur B., Co., Newark, N. J.
*D3* Driver Harris Co., Harrison, N. J.
*D4* Dickson Weatherproof Nail Co., Evanston, Ill.

*E1* Eastern Stainless Steel Corp., Baltimore
*E2* Empire Reeves Steel Corp., Mansfield, O.
*E3* Enamel Products & Plating Co., McKeesport, Pa.

*F1* Firth Sterling, Inc., McKeesport, Pa.
*F2* Fitzsimons Steel Corp., Youngstown
*F3* Follansbee Steel Corp., Follansbee, W. Va.

*G2* Granite City Steel Co., Granite City, Ill.
*G3* Great Lakes Steel Corp., Detroit
*G4* Greer Steel Co., Dover, O.
*G5* Green River Steel Corp., Owenboro, Ky.

*H1* Hanna Furnace Corp., Detroit
*H2* Hercules Drawn Steel Corp., Toledo, O.

*I2* Ingersoll Steel Div., New Castle, Ind.
*I3* Inland Steel Co., Chicago, Ill.
*I4* Interlake Iron Corp., Cleveland

*J1* Jackson Iron & Steel Co., Jackson, O.
*J2* Jessop Steel Corp., Washington, Pa.
*J3* Jones & Laughlin Steel Corp., Pittsburgh
*J4* Joslyn Mfg. & Supply Co., Chicago
*J5* Judson Steel Corp., Emeryville, Calif.

*K1* Kaiser Steel Corp., Fontana, Calif.
*K2* Keystone Steel & Wire Co., Peoria
*K4* Keystone Drawn Steel Co., Spring City, Pa.

*L1* Laclede Steel Co., St. Louis
*L2* La Salle Steel Co., Chicago
*L3* Lone Star Steel Co., Dallas
*L4* Lukens Steel Co., Coatesville, Pa.

*M1* Mahoning Valley Steel Co., Niles, O
*M2* McLouth Steel Corp., Detroit
*M3* Mercer Tube & Mfg. Co., Sharon, Pa.
*M4* Mid States Steel & Wire Co., Crawfordsville, Ind.
*M7* Milton Steel Products Div., Milton, Pa.
*M8* Mill Strip Products Co., Evanston, Ill.
*M9* Moltrup Steel Products Co., Beaver Falls, Pa.
*M10* Mill Strip Products Co., of Pa., New Castle, Pa.

*N1* National Supply Co., Pittsburgh
*N2* National Tube Div., Pittsburgh
*N4* Northwestern Steel & Wire Co., Sterling, Ill.
*N6* Northwest Steel Rolling Mills, Seattle
*N7* Newman Crosby Steel Co., Pawtucket, R. I.
*N8* Carpenter Steel of New England, Inc., Bridgeport, Conn.
*N9* Nelson Steel & Wire Co.

*O1* Oliver Iron & Steel Co., Pittsburgh
*O2* Oregon Steel Mills, Portland

*P1* Page Steel & Wire Div., Monessen, Pa.
*P2* Phoenix Steel Corp., Phoenixville, Pa.
*P3* Pilgrim Drawn Steel Div., Plymouth, Mich.
*P4* Pittsburgh Coke & Chemical Co., Pittsburgh
*P6* Pittsburgh Steel Co., Pittsburgh
*P7* Portsmouth Div., Detroit Steel Corp., Detroit
*P8* Plymouth Steel Co., Detroit
*P9* Pacific States Steel Co., Niles, Cal.
*P10* Precision Drawn Steel Co., Camden, N. J.
*P11* Production Steel Strip Corp., Detroit
*P13* Phoenix Mfg. Co., Joliet, Ill.
*P14* Pacific Tube Co.
*P15* Philadelphia Steel and Wire Corp.

*R1* Reeves Steel & Mfg. Div., Dover, O.
*R2* Reliance Div., Eaton Mfg. Co., Massillon, O.
*R3* Republic Steel Corp., Cleveland
*R4* Roebling Sons Co., John A., Trenton, N. J.
*R5* Jones & Laughlin Steel Corp., Stainless and Strip Div.
*R6* Rodney Metals, Inc., New Bedford, Mass.
*R7* Rome Strip Steel Co., Rome, N. Y.

*S1* Sharon Steel Corp., Sharon, Pa.
*S2* Sheffield Steel Div., Kansas City
*S3* Shenango Furnace Co., Pittsburgh
*S4* Simonds Saw and Steel Co., Fitchburg, Mass.
*S5* Sweet's Steel Co., Williamsport, Pa.
*S7* Stanley Works, New Britain, Conn.
*S8* Superior Drawn Steel Co., Monaca, Pa.
*S9* Superior Steel Div. of Copperweld Steel Co.
*S10* Seneca Steel Service, Buffalo
*S11* Southern Electric Steel Co., Birmingham
*S12* Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
*S13* Seymour Mfg. Co., Seymour, Conn.
*S14* Screw and Bolt Corp. of America, Pittsburgh, Pa.

*T1* Tonawanda Iron Div., N. Tonawanda, N. Y.
*T2* Tennessee Coal & Iron Div., Fairfield
*T3* Tennessee Products & Chem. Corp., Nashville
*T4* Thomas Strip Div., Warren, O.
*T5* Timken Steel & Tube Div., Canton, O.
*T7* Texas Steel Co., Fort Worth
*T8* Thompson Wire Co., Boston

*U1* United States Steel Corp., Pittsburgh
*U2* Universal-Cyclops Steel Corp., Bridgeville, Pa.
*U3* Ulbrich Stainless Steels, Wallingford, Conn.
*U4* U. S. Pipe & Foundry Co., Birmingham

*W1* Wallingford Steel Co., Wallingford, Conn.
*W2* Washington Steel Corp., Washington, Pa.
*W3* Weirton Steel Co., Weirton, W. Va.
*W4* Wheatland Tube Co., Wheatland, Pa.
*W5* Wheeling Steel Corp., Wheeling, W. Va.
*W6* Wickwire Spencer Steel Div., Buffalo
*W7* Wilson Steel & Wire Co., Chicago.
*W8* Wisconsin Steel Div., S. Chicago, Ill.
*W9* Woodward Iron Co., Woodward, Ala.
*W10* Wyckoff Steel Co., Pittsburgh
*W12* Wallace Barnes Steel Div., Bristol, Conn.

*Y1* Youngstown Sheet & Tube Co., Youngstown, O.

## STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

| Cities | City Delivery‡ Charge | Sheets | | | Strip | Plates | Shapes | Bars | | Alloy Bars | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Hot-Rolled (18 ga. & hvr.) | Cold-Rolled (15 gage) | Galvanized (10 gage)†† | Hot-Rolled | | Standard Structural | Hot-Rolled (merchant) | Cold-Finished | Hot-Rolled 4615 As rolled | Hot-Rolled 4140 Annealed | Cold-Drawn 4615 As rolled | Cold-Drawn 4140 Annealed |
| Atlanta | | 9.37 | 10.61 | 11.83 | 10.85 | 9.73 | 9.94 | 9.53 | 13.24 | ..... | ..... | ..... | ..... |
| Baltimore | $.10 | 7.87 | 9.71 | 10.16 | 11.35 | 9.70 | 9.95 | 8.65 | 11.80 | 17.48 | 16.48 | 21.58 | 20.83 |
| Birmingham | | 8.46 | 10.20 | 10.59 | 9.45 | 8.41 | 8.47 | 8.26 | 13.14 | 16.76 | 16.65 | ..... | ..... |
| Boston** | .10 | 10.00 | 11.20 | 11.87 | 12.50 | 9.95 | 10.60 | 10.15 | 13.45 | 17.79 | 16.69 | 21.89 | 21.04 |
| Buffalo** | .15 | 9.45 | 10.20 | 11.95 | 11.85 | 9.55 | 10.05 | 9.60 | 11.60 | 17.45 | 16.45 | 21.55 | 20.80 |
| Chicago** | .15 | 9.37 | 10.35 | 10.85 | 11.54 | 9.21 | 9.72 | 9.37 | 10.80 | 17.10 | 16.10 | 21.20 | 20.45 |
| Cincinnati** | .15 | 9.53 | 10.41 | 10.90 | 11.86 | 9.59 | 10.29 | 9.48 | 11.68 | 17.42 | 16.42 | 21.52 | 20.77 |
| Cleveland** | .15 | 9.37[1] | 10.81 | 11.07 | 11.66 | 9.45 | 10.11 | 9.69 | 11.40 | 17.21 | 16.21 | 21.31 | 20.56 |
| Denver | | 11.55 | 12.53 | 13.03 | 13.72 | 11.39 | 11.90 | 11.55 | 12.98 | ..... | ..... | ..... | 20.84 |
| Detroit** | .15 | 9.63 | 10.61 | 11.20 | 11.91 | 9.58 | 10.29 | 9.68 | 11.16 | 17.38 | 16.38 | 21.48 | 20.73 |
| Houston** | | 10.17 | 10.98 | 11.35[3] | 11.73 | 9.90 | 9.81 | 9.58 | 13.10 | 17.50 | 16.55 | 21.55 | 20.85 |
| Kansas City | .15 | 10.53 | 11.37 | 10.95 | 12.70 | 10.39 | 10.91 | 10.55 | 11.72 | 17.17 | 15.87 | 21.87 | 21.12 |
| Los Angeles | | 10.35[1] | 11.20 | 12.20 | 12.40 | 10.30 | 10.45 | 10.25 | 14.20 | 18.30 | 17.35 | 22.90 | 22.20 |
| Memphis | .15 | 9.13 | 10.50 | 10.95 | 11.44 | 9.47 | 9.82 | 8.97 | 12.89 | ..... | ..... | ..... | ..... |
| Milwaukee** | .15 | 9.51 | 10.49 | 10.99 | 11.68 | 9.35 | 9.94 | 9.51 | 11.04 | 17.24 | 16.24 | 21.24 | 20.49 |
| New York** | .10 | 10.17 | 10.88 | 11.45 | 12.47 | 10.32 | 11.00 | 10.54 | 13.35 | 17.50 | 16.50 | 21.60 | 20.85 |
| Norfolk | .20 | 8.20 | ..... | ..... | 8.90 | 8.65 | 9.20 | 8.90 | 10.70 | ..... | ..... | ..... | ..... |
| Philadelphia | .10 | 9.90 | 10.10 | 10.76 | 11.35 | 9.70 | 9.95 | 9.75 | 12.05 | 17.48 | 16.48 | 21.58 | 20.83 |
| Pittsburgh** | .15 | 9.37 | 10.81 | 11.83 | 11.64 | 9.21 | 9.72 | 9.37 | 11.40 | 17.10 | 16.10 | 21.20 | 20.45 |
| Portland | | 9.45 | 11.30 | 12.35 | 12.40 | 10.55 | 11.00 | 9.45 | 16.65 | 18.60 | 17.85 | 22.70 | 22.15 |
| San Francisco | .10 | 10.75 | 11.75[2] | 11.95 | 12.80 | 10.90 | 11.20 | 10.65 | 15.20 | 18.30 | 17.35 | 22.90 | 22.20 |
| Seattle | | 11.35 | 12.45 | 13.40 | 12.80 | 10.95 | 11.50 | 10.80 | 16.20 | 18.60 | 18.00 | 22.70 | 22.15 |
| Spokane | .15 | 11.35 | 12.45 | 13.40 | 12.80 | 10.95 | 11.50 | 10.80 | 16.35 | 17.75 | 17.95 | 21.58 | 22.30 |
| St. Louis** | .15 | 9.57 | 10.73 | 11.23 | 11.74 | 9.43 | 9.95 | 9.59 | 11.43 | 17.48 | 16.48 | 21.58 | 20.83 |
| St. Paul | .15 | 9.72 | 10.39 | 11.54 | 11.89 | 9.56 | 10.07 | 9.72 | 11.64 | ..... | 16.69 | ..... | 21.04 |

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—3/8" x 1"; Plate—1/4" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—3/4-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1 3/4" to 2 7/8"; cold drawn—15/16" to 2 7/8" round; Hot-rolled 4140—5/8" to 2 7/8" round, cold drawn—15/16" to 2 7/8" round.

†† 13e zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective June 12, 1961)

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

| Producing Point | Basic | Fdry. | Mall. | Bess. | Low Phos. |
|---|---|---|---|---|---|
| Birdsboro, Pa. *B6* | 68.00 | 68.50 | 69.00 | 69.50 | 73.00 |
| Birmingham *R3* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Birmingham *W9* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Birmingham *U4* | 62.00 | 62.50* | 66.50 | ..... | ..... |
| Buffalo *R3* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Buffalo *H1* | 66.00 | 66.50 | 67.00 | 67.50 | 71.50† |
| Buffalo *W6* | 66.00 | 66.50 | 67.00 | 67.50 | ..... |
| Chester *P2* | 68.00 | 68.50 | 69.00 | ..... | ..... |
| Chicago *I4* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Cleveland *A5* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Cleveland *R3* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Duluth *I4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Erie *I4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| Fontana *K1* | 75.00 | 75.50 | ..... | ..... | ..... |
| Geneva, Utah *C7* | 66.00 | 66.50 | ..... | ..... | ..... |
| Granite City *G2* | 67.90 | 68.40 | 68.90 | ..... | ..... |
| Hubbard *Y1* | ..... | ..... | 66.50 | ..... | ..... |
| Ironton, Utah *C7* | 66.00 | 66.50 | ..... | ..... | 73.00 |
| Lyles, Tenn. *T3* | ..... | ..... | ..... | ..... | ..... |
| Midland *C11* | 66.00 | ..... | ..... | ..... | ..... |
| Minnequa *C6* | 68.00 | 68.50 | 69.00 | ..... | ..... |
| Monessen *P6* | 66.00 | ..... | ..... | ..... | ..... |
| Neville Is. *P4* | 66.00 | 66.50 | 66.50 | 67.00 | 71.00† |
| N. Tonawanda *T1* | ..... | 66.50 | 67.00 | 67.50 | ..... |
| Rockwood *T3* | 62.00 | 62.50 | 66.50 | 67.00 | 73.00 |
| Sharpsville *S3* | 66.00 | ..... | 66.50 | 67.00 | ..... |
| So. Chicago *R3* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| So. Chicago *W8* | 66.00 | ..... | 66.50 | 67.00 | ..... |
| Swedeland *A2* | 68.00 | 68.50 | 69.00 | 69.50 | 71.00† |
| Toledo *I4* | 66.00 | 66.50 | 66.50 | 67.00 | ..... |
| Troy, N. Y. *R3* | 68.00 | 68.50 | 69.00 | 69.50 | 73.00 |
| Youngstown *Y1* | ..... | ..... | 66.50 | ..... | ..... |

**DIFFERENTIALS:** Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

## FASTENERS

*(Base discounts, f.o.b. mill, based on latest list prices)*

### Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

*(Discount for 1 container)* — Pct

| | |
|---|---|
| Plain finish—packaged and bulk | 46 |
| Hot galvanized and zinc plated—packaged | 39.25 |
| Hot galvanized and zinc plated—bulk | 46 |

### Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

*(Discount for 1 container)* — Pct

| | |
|---|---|
| Plain finish—packaged and bulk | 46 |
| Hot galvanized and zinc plated—packaged | 39.25 |
| Hot galvanized and zinc plated—bulk | 46 |

### Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

*(Discount for 1 container)*

| | |
|---|---|
| Plain finish—packaged and bulk | 46 |
| Hot galvanized and zinc plated—packaged | 39.25 |
| Hot galvanized and zinc plated—bulk | 46 |

*(On all the above categories add 25 pct for less than container quantities. Minimum plating charge—$10.00 per item. Price on application assembled to bolts.)*

### Machine Screws and Stove Bolts

*(Packages—plain finish)*

| | Discount Screws | Bolts |
|---|---|---|
| Full Cartons | 46 | 46 |
| **Machine Screws—bulk** | | |
| ¼ in. diam or smaller — 25,000 pcs | 50 | |
| 5/16, ⅜ & ½ in. diam — 15,000 pcs | 50 | |

### Machine Screw and Stove Bolt Nuts

*(Packages—plain finish)*

| | Discount Hex | Square |
|---|---|---|
| Full Cartons | 46 | 57 |
| Bulk | | |
| ¼ in. diam or smaller — 25,000 pcs | 56 | 60 |
| 5/16 or ⅜ in. diam — 15,000 pcs | 56 | 60 |

### Rivets

| | |
|---|---|
| | *Base per 100 lb* |
| ½ in. diam and larger | $12.85 |
| | *Pct Off List* |
| 7/16 in. and smaller | 15 |

NOTE: Ferroalloy prices are published in alternate issues.

## TOOL STEEL

*F.o.b. mill*

| W | Cr | V | Mo | Co | per lb | AISI |
|---|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.84 | T-1 |
| 18 | 4 | 1 | — | 5 | 2.545 | T-4 |
| 18 | 4 | 2 | — | — | 2.005 | T-2 |
| 1.5 | 4 | 1.5 | 8 | — | 1.20 | M-1 |
| 6 | 4 | 3 | 6 | — | 1.59 | M-3 |
| 6 | 4 | 2 | 5 | — | 1.345 | M-2 |
| High-carbon chromium | | | | | .955 | D-3, D-5 |
| Oil hardened manganese | | | | | .505 | O-2 |
| Special carbon | | | | | .38 | W-1 |
| Extra carbon | | | | | .38 | W-1 |
| Regular carbon | | | | | .325 | W-1 |

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

## LAKE SUPERIOR ORES

*51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.*

| | *Gross Ton* |
|---|---|
| Openhearth lump | $12.70 |
| Old range, bessemer | 11.85 |
| Old range, nonbessemer | 11.70 |
| Mesabi, bessemer | 11.60 |
| Mesabi, nonbessemer | 11.45 |
| High phosphorus | 11.45 |

(Effective June 12, 1961)

## STAINLESS STEEL

Base price cents per lb. f.o.b. mill

| Product | 201 | 202 | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 403 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ingots, reroll. | 22.75 | 24.75 | 24.00 | 26.25 | — | 28.00 | 41.25 | 33.50 | 38.50 | — | 17.50 | — | 17.75 |
| Slabs, billets | 25.00 | 28.25 | 26.00 | 29.50 | 32.00 | 29.50 | 47.50 | 38.00 | 46.50 | — | 19.25–21.50 | — | 19.75–21.75 |
| Billets, forging | — | 37.75 | 38.75 | 39.50 | 42.50 | 39.50 | 64.50 | 48.75 | 57.75 | 29.25 | 29.25–26.75 | 29.75 | 29.75 |
| Bars, struct. | 43.50 | 44.50 | 46.00 | 46.75 | 49.75 | 46.75 | 75.75 | 57.50 | 67.25 | 35.00 | 35.00–31.50 | 35.50 | 35.50 |
| Plates | 39.25 | 40.00 | 41.25 | 42.25 | 45.00 | 45.75 | 71.75 | 54.75 | 64.75 | 30.00 | 30.00 | 31.25–31.75 | 31.00 |
| Sheets | 48.50 | 49.25 | 51.25 | 52.00 | 56.75 | 52.00 | 80.75 | 65.50 | 79.25 | 40.25 | 40.25 | 48.25 | 40.75 |
| Strip, hot-rolled | 36.00 | 39.00 | 37.25 | 40.50 | — | 40.50 | 68.50 | 53.50 | 63.50 | — | 31.00 | — | 32.00 |
| Strip, cold-rolled | 43.50 | 46.75 | 45.00 | 49.50 | 56.75 | 49.50 | 76.75 | 62.25 | 75.25 | 40.25 | 40.25 | 42.50 | 38.75 |
| Wire CF; Rod HR | — | 42.25 | 43.50 | 44.25 | 47.25 | 44.25 | 71.75 | 54.50 | 63.75 | 33.25 | 33.25–29.75 | 33.75 | 33.75 |

STAINLESS STEEL PRODUCING POINTS:

*Sheets:* Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

*Strip:* Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R5;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7,* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

*Bar:* Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

*Wire:* Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

*Structurals:* Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago. *U1.*

*Plates:* Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

*Forging billets:* Ambridge Pa., *B7;* Midland Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails | Woven Wire Fence | "T" Fence Posts | Single Loop Bale Ties | Galv. Barbed and Twisted Barbless Wire | Merch. Wire Ann'ld ¢/lb. | Merch. Wire Galv. ¢/lb. |
|---|---|---|---|---|---|---|---|
| | Col | Col | Col | Col | Col | | |
| Alabama City *R3* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Aliquippa *J3*** | 173 | 190 | ... | ... | 190 | 9.00 | 9.675 |
| Atlanta *A8*** | 173 | 191 | ... | 212 | 197 | 9.00 | 9.75 |
| Bartonville *K2*** | 175 | 193 | 183 | 214 | 199 | 9.10 | 9.85 |
| Buffalo *W6* | ..... | ..... | ..... | ..... | ..... | 9.00 | 9.55* |
| Chicago *N4* | 173 | 191 | 177 | 212 | 197 | 9.00 | 9.75 |
| Chicago *R3* | ..... | ..... | ..... | ..... | ..... | 9.00 | 9.55 |
| Chicago *W7* | 173 | ..... | ..... | ..... | ..... | 9.00 | 9.55† |
| Cleveland *A6* | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Cleveland *A5* | ..... | ..... | ..... | ..... | ..... | 9.00 | ..... |
| Crawf'dav. *M4*** | 175 | 192 | ... | 214 | 198 | 9.10 | 9.80 |
| Donora Pa. *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Duluth *A5* | 173 | 187 | 177 | 212 | 193 | 9.00 | 9.55 |
| Fairfield, Ala. *T2* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Galveston *D4* | 9.10‡ | ..... | ..... | ..... | ..... | ..... | ..... |
| Houston *S2** | 178 | 192 | ... | 217 | 198 | 9.25 | 9.80† |
| Jacksonville *M4* | 175 | 192 | ... | 214 | 198 | 9.10 | 9.80†† |
| Johnstown *B3*** | 173 | 190 | 177 | ... | 196 | 9.00 | 9.675 |
| Joliet Ill. *A5* | 173 | 187 | ... | 212 | 193 | 9.00 | 9.55 |
| Kokomo *C9** | 175 | 189 | ... | 214 | 195* | 9.10 | 9.65* |
| L. Angeles *B2**** | ..... | ..... | ..... | ..... | ..... | 9.95 | 10.625 |
| Kansas City *S2** | 178 | 192 | ... | 217 | 198* | 9.25 | 9.80† |
| Minnequa *C6* | 178 | 192 | 182 | 217 | 198† | 9.25 | 9.80† |
| Palmer, Mass *W6* | ..... | ..... | ..... | ..... | ..... | 9.30 | 9.85* |
| Pittsburg, Cal. *C7* | 192 | 210 | ..... | ..... | 213 | 9.95 | 10.50 |
| Rankin Pa. *A5* | 173 | 187 | ..... | ..... | 193 | 9.00 | 9.55 |
| So. Chicago *R3* | 173 | 187 | ..... | ..... | 193 | 8.65 | 9.20 |
| S. San Fran. *C6* | ..... | ..... | ..... | 236 | ..... | 9.95 | 10.50 |
| SparrowsPt. *B3*** | 175 | ..... | ..... | 215 | 198 | 9.10 | 9.775 |
| Struthers, O. *Y1** | ..... | ..... | ..... | ..... | ..... | 8.65 | 9.20 |
| Worcester *A5* | 179 | ..... | ..... | ..... | ..... | 9.30 | 9.85 |
| Williamsport *S5* | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

* Zinc less than .10¢. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras.
‡ Wholesalers only. †† 0.115¢ zinc.

## PIPE AND TUBING

**Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.**

| STANDARD T. & C. | BUTTWELD | | | | | | | | | | | | | | SEAMLESS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ½ In. | | ¾ In. | | 1 In. | | 1¼ In. | | 1½ In. | | 2 In. | | 2½–3 In. | | 2 In. | | 2½ In. | | 3 In. | | 3½–4 In. | |
| | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. | Blk. | Gal. |
| Sparrows Pt. *B3* | 0.25 | *15.0 | 3.25 | *11.0 | 6.75 | *6.50 | 9.25 | *5.75 | 9.75 | *4.75 | 10.25 | *4.25 | 11.75 | *4.50 | | | | | | | | |
| Youngstown *R3* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | | | | | | | | |
| Fontana *K1* | *10.75 | *26.00 | *7.75 | *22.00 | *4.25 | *17.50 | *1.75 | *16.75 | *1.25 | *15.75 | *0.75 | *15.25 | 0.75 | *15.50 | | | | | | | | |
| Pittsburgh *J3* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| Alton, Ill. *L1* | 0.25 | *15.0 | 3.25 | *11.0 | 6.75 | *6.50 | 9.25 | *5.75 | 9.75 | *4.75 | 10.25 | *4.25 | 11.75 | *4.50 | | | | | | | | |
| Sharon *M3* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | | | | | | | | |
| Fairless *N2* | 0.25 | *15.0 | 3.25 | *11.0 | 6.75 | *6.50 | 9.25 | *5.75 | 9.75 | *4.75 | 10.25 | *4.25 | 11.75 | *4.50 | | | | | | | | |
| Pittsburgh *N1* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| Wheeling *W5* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | | | | | | | | |
| Wheatland *W4* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | | | | | | | | |
| Youngstown *Y1* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| Indiana Harbor *Y1* | 1.25 | *14.0 | 4.25 | *10.0 | 7.75 | *5.50 | 10.25 | *4.75 | 10.75 | *3.75 | 11.25 | *3.25 | 12.75 | *3.50 | | | | | | | | |
| Lorain *N2* | 2.25 | *13.0 | 5.25 | *9.0 | 8.75 | *4.50 | 11.25 | *3.75 | 11.75 | *2.75 | 12.25 | *2.25 | 13.75 | *2.50 | *12.25 | *27.25 | *5.75 | *22.50 | *3.25 | *20.0 | *1.75 | *18.50 |
| **EXTRA STRONG PLAIN ENDS** | | | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt. *B3* | 4.75 | *9.0 | 8.75 | *5.0 | 11.75 | *0.50 | 12.25 | *1.75 | 12.75 | *0.75 | 13.25 | *0.25 | 13.75 | *1.50 | | | | | | | | |
| Youngstown *R3* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Fairless *N2* | 4.75 | *9.0 | 8.75 | *5.0 | 11.75 | *0.50 | 12.25 | *1.75 | 12.75 | *0.75 | 13.25 | *0.25 | 13.75 | *1.50 | | | | | | | | |
| Fontana *K1* | *6.25 | | *2.25 | | 0.75 | | 1.25 | | 1.75 | | 2.25 | | 2.75 | | | | | | | | | |
| Pittsburgh *J3* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |
| Alton, Ill. *L1* | 4.75 | *9.0 | 8.75 | *5.0 | 11.75 | *0.50 | 12.25 | *1.75 | 12.75 | *0.75 | 13.25 | *0.25 | 13.75 | *1.50 | | | | | | | | |
| Sharon *M3* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Pittsburgh *N1* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |
| Wheeling *W5* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Wheatland *W4* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | | | | | | | | |
| Youngstown *Y1* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |
| Indiana Harbor *Y1* | 5.75 | *8.0 | 9.75 | *4.0 | 12.75 | 0.50 | 13.25 | *0.75 | 13.75 | 0.25 | 14.25 | 0.75 | 14.75 | *0.50 | | | | | | | | |
| Lorain *N2* | 6.75 | *7.0 | 10.75 | *3.0 | 13.75 | 1.50 | 14.25 | 0.25 | 14.75 | 1.25 | 15.25 | 1.75 | 15.75 | 0.50 | *10.75 | *24.75 | *3.25 | *19.0 | *0.75 | *16.50 | 4.25 | *11.50 |

**Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.**

**Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.**

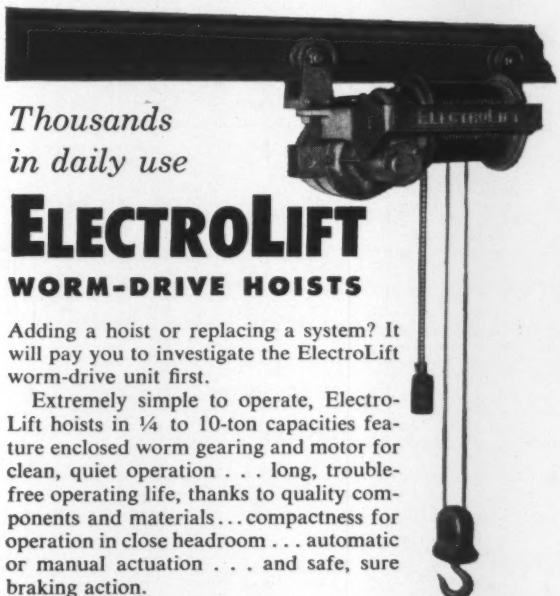
## CAST IRON WATER PIPE INDEX

| | |
|---|---|
| Birmingham | 125.8 |
| New York | 138.6 |
| Chicago | 140.0 |
| San Francisco-L. A. | 148.6 |

*Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.*

## COKE

| Furnace, beehive (f.o.b.) | Net-Ton |
|---|---|
| Connellsville, Pa. | $14.75 to $15.50 |
| Foundry, beehive (f.o.b.) | $18.50 |
| Foundry oven coke | |
| Buffalo, del'd | $33.25 |
| Chattanooga, Tenn. | 30.80 |
| Ironton, O., f.o.b. | 30.50 |
| Detroit, f.o.b. | 32.00 |
| New England, del'd | 33.55 |
| New Haven, f.o.b. | 31.00 |
| Kearny, N. J., f.o.b. | 31.25 |
| Philadelphia, f.o.b. | 31.00 |
| Swedeland, Pa., f.o.b. | 31.00 |
| Painesville, Ohio, f.o.b. | 32.00 |
| Erie, Pa., f.o.b. | 32.00 |
| St. Paul, f.o.b. | 31.25 |
| St Louis, f.o.b. | 33.00 |
| Birmingham, f.o.b. | 30.35 |
| Milwaukee, f.o.b. | 32.00 |
| Neville Is., Pa. | 30.75 |

*Thousands in daily use*

**ELECTROLIFT**

**WORM-DRIVE HOISTS**

Adding a hoist or replacing a system? It will pay you to investigate the ElectroLift worm-drive unit first.

Extremely simple to operate, ElectroLift hoists in ¼ to 10-ton capacities feature enclosed worm gearing and motor for clean, quiet operation . . . long, trouble-free operating life, thanks to quality components and materials . . . compactness for operation in close headroom . . . automatic or manual actuation . . . and safe, sure braking action.

For the model, speed and operation best suited to your needs, consult your classified directory for the nearest ElectroLift representative.

7989

WORM DRIVE ELECTROLIFT HOISTS

**204 Sargeant Avenue** **Clifton, N. J.**

**Mark 5F Ultrasonic Flaw Detector**

Price for single frequency unit — **$1785.00** plus accessories

Portable, ultrasonic testing equipment provides on-the-spot inspection of metals, ceramics and similar materials. Curtiss-Wright's Mark 5F clearly locates cracks or other internal and surface defects with exceptional close-to-the-surface sensitivity. The Mark 5F is designed to provide optimum performance over a broad range of quality improvements and cost reduction applications in laboratories, shops, or in the field.

- **Portable** — 5¼" wide x 10⅝" high x 18⅛" deep
- **Lightweight** — weighs only 28 lbs.
- **Exceptional Sensitivity** — detects flaws as small as ¼₄" diameter
- **High Resolution** — defects of 3/64" diameter can be detected .030" below the surface.
- **Operating Flexibility** — provides test frequencies from .6 to 5.0 megacycles.
- **Clear Presentation** — high brightness cathode ray tube provides easy viewing, even in full daylight.

Write for additional information or phone SWinburne 9-0500

**CURTISS WRIGHT**

**Princeton Division CORPORATION Princeton, New Jersey**

## RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Tie Plates | Track Bolts Untreated |
|---|---|---|---|---|---|---|
| Bessemer *U1* | 5.75 | 6.725 | 7.25 | | | |
| Cleveland *R3* | | | | | | 15.35 |
| So. Chicago *R3* | | | | 10.10 | | |
| Easley *T2* | 5.75 | 6.725 | | | | |
| Fairfield *T2* | | 6.725 | | 10.10 | 6.875 | |
| Gary *U1* | 5.75 | | | | 6.875 | |
| Huntington, *C16* | | 6.725 | | | | |
| Ind. Harbor *I3* | | | | 10.10 | | |
| Johnstown *B3* | | 6.725 | | | | |
| Joliet *U1* | | | 7.25 | | | |
| Kansas City *S2* | | | | 10.10 | | 15.35 |
| Lackawanna *B3* | 5.75 | 6.725 | 7.25 | | 6.875 | |
| Lebanon *B3* | | | 7.25 | | | 15.35 |
| Minnequa *C6* | 5.75 | 7.225 | 7.25 | 10.10 | 6.875 | 15.35 |
| Pittsburgh *S14* | | | | | | 15.35 |
| Pittsburgh *J3* | | | | 10.10 | | |
| Seattle *B2* | | | | | 7 025 | 15.85 |
| Steelton *B3* | 5.75 | | 7.25 | | 6.875 | |
| Struthers *Y1* | | | | 10.10 | | |
| Torrance *C7* | | | | | 6.75 | |
| Williamsport *S5* | | 6.725 | | | | |
| Youngstown *R3* | | | | 10.10 | | |

## C-R SPRING STEEL

| Cents Per Lb F.o.b. Mill | CARBON CONTENT 0.26-0.40 | 0.41-0.60 | 0.61-0.80 | 0.81-1.05 | 1.06-1.35 |
|---|---|---|---|---|---|
| Anderson, Ind. *G4* | 9.10 | | | | |
| Baltimore, Md. *T8* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Bristol, Conn. *W12* | | 10.70 | 12.90 | 16.10 | 19.30 |
| Boston *T8* | 9.50 | 10.70 | 12.84 | 15.90 | 18.85 |
| Buffalo, N. Y. *R7* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Carnegie, Pa. *S9* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Cleveland *A5* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Dearborn *S1* | 9.05 | 10.50 | 12.70 | | |
| Detroit *D1* | 9.05 | 10.50 | 12.70 | 15.70 | |
| Detroit *D2* | 9.05 | 10.50 | 12.70 | | |
| Dover, O. *G4* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Evanston, Ill. *M8* | 9.05 | 10.40 | 12.60 | 15.60 | |
| Franklin Park, Ill. *T8* | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Harrison, N. J. *C11* | | | 12.90 | 16.10 | 19.30 |
| Indianapolis *R5* | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |
| Los Angeles *C1* | 11.15 | 12.60 | 14.80 | 17.80 | |
| New Britain, Conn. *S7* | 9.40 | 10.70 | 12.90 | 15.90 | 18.85 |
| New Castle, Pa. *B4* | 8.95 | 10.40 | 12.60 | 15.60 | |
| New Castle, Pa. *M10* | 8.95 | 10.40 | 12.60 | 15.60 | |
| New Haven, Conn. *D1* | 9.40 | 10.70 | 12.90 | 15.90 | |
| Pawtucket, R. I. *N7* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Riverdale, Ill. *A1* | 9.05 | 10.40 | 12.60 | 15.60 | 18.55 |
| Sharon, Pa. *S1* | 8.95 | 10.40 | 12.60 | 15.60 | 18.55 |
| Trenton, *R4* | | 10.70 | 12.90 | 16.10 | 19.30 |
| Warren, Ohio *T4* | 8.95 | 10.40 | 12.60 | 15.60 | 18.75 |
| Worcester, Mass. *A5* | 9.50 | 10.70 | 12.90 | 15.90 | 18.85 |
| Youngstown *R5* | 9.10 | 10.55 | 12.60 | 15.60 | 18.55 |

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, frt allowed in quantity)*

Copper
- Rolled elliptical, 18 in. or longer, 5000 lb lots ..... 43.50
- Electrodeposited, 5000 lb lots .... 36.50
- OFHC anodes ..... 41.50 to 44.50 (depending on shape)

Brass, 80-20, ball anodes, 2000 lb or more ..... 50.50

Zinc, ball anodes, 2000 lb lots ..... 18.75
(for elliptical add 1¢ per lb)

Nickel, 99 pct plus, rolled carbon, 5000 lb ..... .945
(Rolled depolarized add 3¢ per lb)

Cadmium, 5000 lb ..... 1.60

Tin, ball anodes $1.26 per lb (approx.).

### Chemicals

*(Cents per lb, f.o.b. shipping point)*

Copper cyanide, 100 lb drum, N. Y.. 65.90

Copper sulphate, 25.2 Cu min, 6000 lbs per cwt, Detroit ..... 17.45

Nickel sulfate, 5000 lbs ..... 29.00

Nickel chloride, freight allowed, 100 lb ..... 45.00

Sodium cyanide, domestic, del'd east of Rockies, 200 lb drums.... 25.80

Zinc cyanide, 100 lb, N. Y. ..... 60.75

Potassium cyanide, 100 lb drum N. Y., del'd east of Rockies..... 46.50

Chromic acid, flake type, 10,000 lb or more, N. Y. ..... 30.44

## METAL POWDERS

*(Cents per lb, f.o.b. shipping point for ton lots or over, except as noted)*

### Iron Powders

| | |
|---|---|
| Molding grade, domestic and foreign, 98 pct Fe, 100 mesh bags, freight allowed east of Miss. R. | 11.50 |
| Electrolytic Iron, melting stock, 99.87 pct Fe, truckload lots ..... | 25.75 |
| Carbonyl Iron (200 lb lots) ..... | 88.00 |
| Welding Grades ..... | 8.10 |
| Cutting and Scarfing Grades ..... | 9.85 |
| Hydrogen reduced, domestic ..... | 11.25 |

### Copper Powders

| | |
|---|---|
| Molding Grades | |
| Electrolytic, domestic, f.o.b. shipping point. | 15.00† |
| Atomized ..... | 44.3 to 62.3 |
| Reduced ..... | 15.00† |
| Chemically Precipitated | 45.5 |
| Brass, 5000-lb lots ..... | 33.1 to 50.3 |
| Bronze, 5000-lb lots ..... | 51.0 to 55.8 |
| Chromium, electrolytic .... | 5.00 |
| Lead ..... | 7.50† |
| Manganese, electrolytic ... | $1.00 |
| Molybdenum ..... | $3.60 to $4.35 |
| Nickel ..... | $1.15 |
| Carbonyl Nickel, 20,000 lb lots ..... | $1.01 |
| Nickel-Silver, 5000 lb lots.. | 54.7 to 67.3 |
| Silicon ..... | 70.00 |
| Solder ..... | 7.00† |
| Stainless Steel, 316 ..... | $1.07 |
| Stainless steel 304 ..... | 89.00 |
| Tin ..... | 14.00† |
| Titanium, 99.25 + pct, per lb, f.o.b. ..... | $11.25 |
| Tungsten, carbide grades... | $3.25 |
| Zinc ..... | 19.5 to 27.5 |

† Plus cost of metal.

## ELECTRICAL SHEETS

| 22-Gage F.o.b. Mill Cents Per Lb | Hot-Rolled (Cut Lengths)* | Cold-Reduced (Coiled or Cut Length) Semi-Processed | Fully Processed |
|---|---|---|---|
| Field | | 9.875 | |
| Armature | 11.70 | 11.20 | 11.70 |
| Elect. | 12.40 | 11.90 | 12.40 |
| Special Motor | | 12.475 | |
| Motor | 13.55 | 13.05 | 13.55 |
| Dynamo | 14.65 | 14.15 | 14.65 |
| Trans. 72 | 15.70 | 15.20 | 15.70 |
| Trans. 65 | 16.30 | | |
| | | Grain Oriented | |
| Trans. 58 | 16.80 | Trans. 80 | 19.70 |
| Trans. 52 | 17.85 | Trans. 73 | 20.20 |
| | | Trans. 66 | 20.70 |

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S7*); Vandergrift (*U1*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

## CLAD STEEL

Base prices, cents per lb f.o.b.

| | Cladding | Plate (*L4, P2, A3, J2*) 10 pct | 15 pct | 20 pct | Sheet (*I2*) 20 pct |
|---|---|---|---|---|---|
| Stainless Type | 302 | | | | 37.50 |
| | 304 | 28.80 | 31.55 | 34.30 | 40.00 |
| | 316 | 42.20 | 46.25 | 50.25 | 58.75 |
| | 321 | 34.50 | 37.75 | 41.05 | 47.25 |
| | 347 | 40.80 | 44.65 | 48.55 | 57.00 |
| | 405 | 24.60 | 26.90 | 29.25 | ..... |
| | 410 | 22.70 | 24.85 | 27.00 | ..... |
| | 430 | 23.45 | 25.65 | 27.90 | ..... |

CR Strip (S9) Copper, 10 pct, 2 sides, $43.85; 1 side, $36.60.

(Effective June 12, 1961)

## REFRACTORIES

### Fire Clay Brick

*Carloads per 1000*

| | |
|---|---|
| Super duty, Mo., Pa., Md., Ky.... | $185.00 |
| High duty (except Salina, Pa., add $5.00) ..... | 133.00 |
| Medium duty ..... | 125.00 |
| Low duty (except Salina, Pa., add $2.00) ..... | 103.00 |
| Ground fire clay, net ton, bulk... | 22.50 |

### Silica Brick

| | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. ..... | $158.00 |
| Childs, Hays ..... | 163.00 |
| Chicago District ..... | 168.00 |
| Western Utah ..... | 183.00 |
| California ..... | 185.00 |
| Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O. ..... | 163.00-168.00 |
| Silica cement, net ton, bulk, Chicago ..... | 26.75 |
| Silica cement, net ton, bulk, Ensley, Ala. ..... | 27.75 |
| Silica cement, net ton, bulk, Mt. Union, Pa. ..... | 25.75 |
| Silica cement, net ton, bulk, Utah and Calif. ..... | 39.00 |

### Chrome Brick

| | |
|---|---|
| Standard chemically bonded, Baltimore, Md. ..... | $620.00 |
| Gary, Ind. ..... | 658.50 |
| Standard, Pascagoula, Miss. ..... | 647.50 |
| Standard chemically bonded, Curtiner, Calif. ..... | 119.00 |
| Burned, Baltimore ..... | 585.00 |

### Magnesite Brick

| | |
|---|---|
| Standard, Baltimore ..... | $715.00 |
| Chemically bonded, Baltimore .... | 655.00 |
| Chemically bonded, Pascagoula, Miss. ..... | 682.50 |

### Grain Magnesite

St. ⅜ to ½-in. grains

*Per net ton*

| | |
|---|---|
| Domestic, f.o.b. Baltimore in bulk. | $73.00 |
| Domestic, f.o.b., Pascagoula, Miss... | 80.00 |
| Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk ..... | 46.00 |
| in sacks ..... | 52.00-54.00 |

### Dead Burned Dolomite

| | |
|---|---|
| F.o.b. bulk, producing points in: Pa., W. Va., Ohio ..... | $16.75 |
| Missouri Valley ..... | 15.60 |
| Midwest ..... | 17.00 |

## ELECTRODES

*Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.*

| GRAPHITE Diam. (In.) | Length (In.) | Price | CARBON* Diam. (In.) | Length (In.) | Price |
|---|---|---|---|---|---|
| 24 | 84 | 27.25 | 40 | 100,110 | 12.50 |
| 20 | 72 | 26.50 | 35 | 110 | 11.20 |
| 18 | 72 | 27.50 | 30 | 110 | 11.70 |
| 14 | 72 | 27.25 | 24 | 72 | 11.95 |
| 12 | 72 | 28.25 | 20 | 90 | 11.55 |
| 10 | 60 | 29.50 | 17 | 72 | 12.10 |
| 10 | 48 | 30.00 | 14 | 72 | 12.55 |
| 7 | 60 | 29.75 | 10 | 60 | 13.80 |
| 6 | 60 | 33.25 | 8 | 60 | 14.25 |
| 4 | 40 | 37.00 | | | |
| 3 | 40 | 39.25 | | | |
| 2½ | 30 | 41.50 | | | |
| 2 | 24 | 64.00 | | | |

* Prices shown cover carbon nipples.

## BOILER TUBES

| $ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill | Size OD-In. | B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. |
|---|---|---|---|---|---|
| Babcock & Wilcox.. | 2 | 13 | 40.28 | 47.21 | 35.74 |
| Jones & Laughlin * | 2½ | 12 | 54.23 | 63.57 | 48.13 |
| | 3 | 12 | 62.62 | 73.40 | 55.59 |
| | 3½ | 11 | 73.11 | 85.70 | 65.84 |
| | 4 | 10 | 97.08 | 113.80 | 88.10 |
| National Tube.... | 2 | 13 | 40.28 | 47.21 | 35.74 |
| | 2½ | 12 | 54.23 | 63.57 | 48.13 |
| | 3 | 12 | 62.62 | 73.40 | 55.59 |
| | 3½ | 11 | 73.11 | 85.70 | 65.84 |
| | 4 | 10 | 97.08 | 113.80 | 88.10 |
| Pittsburgh Steel... | 2 | 13 | 40.28 | 47.21 | ..... |
| | 2½ | 12 | 54.23 | 63.57 | ..... |
| | 3 | 12 | 62.62 | 73.40 | ..... |
| | 3½ | 11 | 73.11 | 85.70 | ..... |
| | 4 | 10 | 97.08 | 113.80 | ..... |

* Electricweld only.

*Here is a plan to help you*

# REDUCE SUFFERING AND TRAGEDY

## *With it, your company can* SAVE PRECIOUS LIVES, *while* CUTTING COSTS DUE TO ABSENTEEISM *by as much as 1/3 to 1/2!*

Together, American management and labor have done a remarkable job of reducing the incidence of industrial accidents. In-plant safety campaigns have been so effective that today it is *nonwork accidents* that cause the bulk of lost lives and manhours in our economy.

The National Safety Council has developed a plan to reduce these accidents. Not only will it save lives and prevent crippling injuries, but it will add significantly to the efficiency and net profits of companies which put it into operation.

Let's say you're an average company or corporate unit doing $1 million in sales a year. Your net is around $73,000. National Safety Council figures show that the average nonwork accident costs employers about $72. (You can determine *your* costs with the Council's new nonwork accident report system.) Ten such accidents can cost $720—or about 1% of your net profit. Prevent those accidents and you can *add 1% to your net!* Prevent twenty—and add 2% to net!

*Experience shows that a reduction of nonwork accidents by 30% is possible!* One large company with an excellent in-plant safety record has *cut nonwork accidents by 1/3* with its off-the-job safety program! It's employee's rate for motor vehicle fatalities stands *85% below rate for all U.S. workers!* And its already low *in-plant accident rate came down 50 per cent!*

*Here is a rewarding endeavor that pays immeasurable dividends in human and employee relations—as well as an important untapped source for cost control.* You can institute this kind of program in your company. Send the coupon for a copy of our booklet "The Challenge to Management of Off-the-Job Accidents." It will show you how to determine your non-work accident costs, as well as many tested ways to reduce this steady waste of lives and profits. Send the coupon today.

I Howard Pyle

**HOWARD PYLE**
**President, The National Safety Council**

*Published to save lives in cooperation with The Advertising Council and The National Safety Council*

**SUPPORT YOUR LOCAL SAFETY ORGANIZATION**

THE NATIONAL SAFETY COUNCIL
425 NORTH MICHIGAN AVENUE, CHICAGO 11, ILL.

Please send me a copy of your booklet "The Challenge to Management of Off-the-Job Accidents." I want to learn how my company can save lives while cutting costs.

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

## ELECTRICAL EQUIPMENT RE-NU-BILT GUARANTEED

**M-G SETS 3PH-60 CY.**

| Qu. | KW | Make | RPM | DC Volts | AC Volts |
|---|---|---|---|---|---|
| 2 | 4800 (3U) | GE | 450 | 300 | 2300/4600 |
| 1 | 2400 | GE | 450 | 300 | 2300/4600 |
| 1 | 2000 | GE | 514 | 600 | 2300/4600 |
| 2 | 1750/2100 | GE | 514 | 250/300 | 2300/4600 |
| 1 | 1750 | GE | 514 | 600 | 2300/4600 |
| 1 | 1500 | GE | 720 | 600 | 6600/13200 |
| 1 | 1000 | GE | 720 | 275 | 2300/4160 |
| 1 | 1000 | GE | 900 | 260 | 4000/6600 |
| 1 | 1000 | GE | 900 | 600 | 2300/4160 |
| 1 | 500 | GE | 900 | 125/250 | 440 |
| 1 | 500 (New) | GE | 1200 | 300 | 2300 |
| 1 | 500 | GE | 900 | 250 | 2300/4160/4160 |
| 1 | 300 | GE | 1200 | 275 | 2300/4160 |
| 1 | 300 | GE | 1200 | 250 | 440/2300 |
| 1 | 250 | GE | 900 | 250 | 440/2300 |
| 1 | 240 | Whse. | 900 | 125 | 220/440 |
| 1 | 200 | Whse. | 1200 | 550 | 2300 |
| 1 | 200 | El.Mhy. | 1200 | 250 | 2300/4600 |
| 1 | 150 | GE | 1200 | 275 | 2300 |
| 1 | 150 | Whse. | 1200 | 275 | 2300 |

**D. C. MOTORS**

| Qu. | KW | Make | Type | Volts | RPM |
|---|---|---|---|---|---|
| 1 | 3900 (New) | GE | Enc. S.V. | 475 | 320 |
| 1 | 3000 (New) | Whse. | Enc. F.V. | 525 | 600 |
| 2 | 2700 | GE | Enc. S.V. | 415 | 280 |
| 1 | 2250 (New) | GE | Enc. S.V. | 600 | 200/300 |
| 1 | 2200 | GE | MCF | 600 | 400/500 |
| 2 | 2000 | GE | Enc. S.V. | 350 | 250/350 |
| 2 | 1750 | GE | Enc. S.V. | 250 | 175/350 |
| 2 | 1500 | Whse. | New | 600 | 300/700 |
| 4 | 1500 | Whse. | New | 525 | 600 |
| 1 | 1300 | GE | MCF | 300 | 200/400 |
| 1 | 1200 | GE | MCF | 600 | 450/600 |
| 1 | 1000 | Whse. | | 500 | 800/2000 |
| 4 | 1000 | GM | D-8 | 600 | 600/900 |
| 2 | 900 | GE | MCF | 250 | 180/360 |
| 1 | 850 | GE | MCF | 250 | 85/170 |
| 1 | 750 | GE | MCF | 600 | 120/360 |
| 2 | 750 | GE | MCF | 600 | 450/900 |
| 2 | 645 | SS | | 300 | 1000 |
| 4 | 600 | Whse. | | 250 | 275/550 |
| 5 | 400 | GM | D-8 | 250 | 300/900 |

**BELYEA COMPANY, INC.**

47 Howell Street Jersey City 6, N. J.

Tel. OLdfield 3-3334



Available at a good reduction under mill price steel sheets and plates, limited quantity only, range plates 3/8", 5/16", 1/4", 3/16", any width up to 60" maximum or decimal equivalent, sheets 7, 8, 9, 10, 11, 12, 13, and possibly 14 gauge up to 60" in width, specifications per your choosing from SAE 1005 to SAE 1050, plain, pickled dry, or pickled and oiled available, depending on specifications. Can also supply coils. All material from domestic manufacture off continuous mill. Exact sizes can be supplied. Must have complete specifications and delivery point so that proper quotation can be given. Prefer end-users, however, will accept serious inquiries from resellers. If interested, write:

BOX H-187

c/o The IRON AGE, Chestnut at 56th, Phila. 39



## FOR SALE

**22—COLD RUNNING MILLS**

1—8" x 4" Standard w. Collers 25 HP DC Motor
15—8" x 6" Standard w. Collers 25 HP DC Motor
2—8" x 8" Waterbury-Farrel—25 HP DC Motor
2—8" x 8" Waterbury-Farrel (roll. brg.) 25 HP Motor
2—10" x 10" Blake & Johnson 40/65 HP DC Motor

All Mills with variable speed drives & Coilers, Edge Rollers, etc.

**CURRY & HUDSON ASSOCIATES, INC.**

ONE GATEWAY CENTER, PITTSBURGH 22, PA.




# Midwest Dealers Report Gains

**Used machinery dealers in the Midwest say sales have advanced. Delivery times are starting to lengthen.**

**This has brought a change in buyer psychology. And out-of-area buyers are coming into this market for equipment.**

■ Used machinery sales have advanced in the Midwest. While there are still sources that report little change, delivery times on some rebuilt equipment have started lengthening, and buyers are beginning to ask for faster deliveries.

For example: As recently as two months ago, it was common for buyers to ask a dealer to hold a piece of equipment. Now this practice is disappearing at a fairly rapid rate.

**Prices Firming**—Buyers who've been holding off on purchases will do well to watch this market. Prices are firming. In a few cases, dealers have reported sales drops in late May. But they say this is because they were sold out of the "hotter" items. These dealers are now building inventories.

This move generally forecasts two used tool trends: First, Midwest tool prices, on this basis, look like they'll not only remain firm, but could start advancing soon. And, late model tools will be more difficult to locate as time goes on.

**Psychology Change** — Adding pep to the Midwest market in recent weeks has been a change in buyer psychology and a series of out-of-area buyers. The change in psychology is simply a matter of wanting immediate deliveries.

Though West Coast orders in the Midwest haven't strengthened greatly, Eastern buyers have moved into the Chicago area market in recent weeks with some substantial orders for heavy production equipment of high dollar value.

At the same time, several orders have been placed in the Chicago area for delivery to overseas buyers. While the foreign outlook for U. S. used machine tools has been regarded as poor, there have been recent orders from South America, Europe, and India.

**Seasonal Gains**—Metal fabricating equipment continues to show seasonal gains. Midwest dealers aren't making any specific predictions, but they are confident of a continuing gain in total dollar volume.

While tool room equipment isn't gaining strongly, it's worth remembering that light equipment gains were reported in this column at least two months ago. In the past, a gain in light equipment sales usually suggested gains in other equipment shortly thereafter.

If anything, the current rate of sales is slightly ahead of schedule. Earlier, Midwestern used tool men said the upswing wouldn't be felt until the end of the second quarter. As it proved out, used tool sales have been running ahead of the forecasts for the past several weeks.

It now appears that the gains will continue, after the usual seasonal lull, and could carry through the rest of the year. It's particularly significant that used tool dealers are filling inventories even with the summer lull approaching.

# LIQUIDATION

## FORMER PHOENIX STEEL CORP. PLANT AT HARRISBURG, PA.

## OF PLATE ROLLING MILL

## *Many Items Just Released*

**AIR COMPRESSORS**

(1) CP In Line 75 HP 9¾ x 5½ x 5½ S/N 33739

**BUILDINGS FOR RE-ERECTION—LOADED FOB**

| SPAN C/C OF COLUMNS | LENGTH | HEIGHT TO BOTTOM OF ROOF TRUSS | HEIGHT TO TOP OF CRANE RAIL | SPAN C/C CRANE GIRDERS | CRANE CAPACITY |
|---|---|---|---|---|---|
| 80′-0″ | 110 Ft. | 32′-0″ | 23′-6″ | 76′-10″ | 25 ton |
| 72′-6″ | 200 Ft. | 46′-6″ | 22′-7½″ | 68′-0″ | 25 ton |
| 70′-0″ | 288 Ft. | 30′-0″ | 21′-6″ | 68′-3″ | (2) 10 ton |
| | | | | | 15 ton |
| 70′-0″ | 272 Ft. | 38′-0″ | 29′-6″ | 69′-4″ | (2) 10 ton |
| | | | | | 15 ton |
| 28′-9″ | 66 Ft. | 22′-6″ | 16′-0″ | 26′-1″ | 5 ton |
| 50′-0″ | 160 Ft. | 32′-0″ | 23′-6″ | 46′-10″ | 20 ton |

**FURNACE**

Car Bottom 14′ W x24″ L x 9′ High or Fired—With Brown Inst. Auto. Controls 2000° Max. Car Equip. With Timken Bearings. Cast Wheels Burners — Tate-Jones — Optionally available—10,000 Gal. Oil Tank—FC8 Built 1942

**ELECTRIC ARC MELTING FURNACE**

Heroult 14 ft. shell diam. side charge—30,000/40,000 charge cap.—6,000 KVA transformer—Auto. control.

**FURNACE CHARGERS**

(2) Morgan Eng. 5 ton Cap.
(2) Broslus 4,000 lb. rubber mounted

**HOISTS**

(11) Yale and Towne Cable King 2 ton
(38) Yale and Towne spur gear chain blks. 2 ton & 5 ton

**HYDRAULIC PRESS—1,000 TONS CAPACITY**

(1) Bethlehem Hydraulic Press, 1,000 tons, Platten Over-all Dimensions—15′ R to L. 8′ F to B. Shut Height 18″, Stroke 42″, Maximum Opening 5′, Tee Slots in Top and Bottom Plattens, Vickers Hydraulic Pump 2,500 psi, Cooler, Reservoir, Motor, Controls, etc. Completely rebuilt—New Pumps, Motors, Piping and Valves in 1948.

**JAW CRUSHER**

(1) Climax Stone & Ore Crusher—Opening 10″ x 17″—20 HP

**FURNACE CONTROLS**

(12) Soaking Pit Temp. Panels With Automatic Gas/Oil—Air Proportioners—Brown Inst. Hagan —1949 Excellent Cond. Controls
(6) Sets — Open Hearth Furnace Controls

**LADLES—OPEN HEARTH**

(8) Ladles, bottom pour 150 ton cap. —Pollock
(3) Ladles, lip pour 40 ton cap.—Whiting

**LOCOMOTIVES**

(1) 20 Ton Plymouth Diesel 36″ Ga. Le Roi

**MACHINE SHOP EQUIP.**

**BORING MILL**

(1) Betts, 72″, 2 Hds. 48″ Under Rail, Motor and controls

**DRILL PRESSES**

(1) Box Columnar-typ. Buffalo 22″ —1¼″ cap.

**LATHES—ENGINE**

(1) Schumacher-Boye 36″ x 17′, Mtr. Drive, 16 Speed, Qk. Chng. Gear, Chuck, Stdy. Rest
(1) American 27″ x 11′, Motor Drive 12 speed, Qk. Chng. Gear, Chuck, Tpr. Attch, Stdy. Rest
(1) American 18″ x 6′, Motor Drive, 12 speed, Qk. Chng. Gear, Chuck, Rests, Dogs
(1) Lodge & Shipley 16″ x 52″, Mtr. Drive, 21 speed, Qk. Chng. Gear, Thrd. Dial, Chuck, Rest

**MILLING MACHINE**

(1) Cincinnati, #4, Universal, Vertical Attachment, 16 Speed, Motor and Controls

**PLANERS**

(1) Cincinnati, "Rapid-Traverse," 48″ x 48″ x 18′, 2 Rail Hds. 2 side hds, 35 HP Motor and Controls
(1) Gray 36″ x 36″ x 8′, 2 Rail Hds, 2 side hds, Motor and Controls

**SLOTTER, VERTICAL**

(1) Newton, 18″ Stroke, 42″ Tble Dia. U. S. Varidrive and Controls

**MATERIAL HANDLING EQUIPMENT**

Wide range lift trucks and front loaders—Yale & Towne, Towmotor, Clark, Caterpillar

**METALLURGICAL**

**HOT BLAST CUPOLA**

Rated 15/20 ton/hr. Shell dia. 8′-11″; hearth dia. 7′-0″ stack height 40′; (12) water cooled tuyeres 3.81″ dia. Heat exchanger for preheating 12,000 to 950/1000° F. with Allis Chalmers 10,000 blowers, motors, controls, charging equipment, cyclone dust collector, piping, valves, operating and control instrumentation. Installed 1954.

**MILL DRIVE**

(1) 3,000 HP General Electric Slip Ring Motor, Type I, 2,300 Volt, 60 Cy., 3 HP., 356 RPM with Comp. panel and lub. system, air wash system. Coupled to Mesta 4.6:1 Red. Gear output speed 78 RPM.

**ROLL LATHES**

(1) Pond—60″ Face Plate; 41′-6″ Centers; 12′ tool holder; with floor plate milling att.
(1) Fifield—60″ Face Plate; 14′-0″ Centers with floor plate milling attach.
(1) Garrison—40″ Face Plate; 12′-8″ Tool Holder; 12′ Centers; 10 HP Drive

**ROLLING MILL EQUIPMENT**

SLAB EDGER MILL, PEMCO new 1949—Cap. 72″ x 18″ thick slab with 1,000 HP drive and M.G. Set
(1) Birdsboro 34″ Blooming and slabbing mill—72″ 2 high reversing
(1) Birdsboro 126″ Plate Mill—3 high
(1) Birdsboro 89″ Plate Mill—3 high
(1) Birdsboro 42″ Universal Plate Mill—2 high

**SHEARS**

(1) 1,000 ton hot upcut Pemco—6″ thick by 68″ wide hydraulic—1949
(1) 1″ x 12′ Cincinnati Model 10012 —1951
(1) ¾″ x 9′ Hilles & Jones
(1) Monarch circular Slifting Shear —will handle plates up to 96″ wide x 7/16″ thick, arbor 12″ diam.—65 HP drive new 1949

**TESTING MACHINES**

(1) Tinius Olsen Tensile Testing Machine 400,000#

**TOOLS**

Air grinders, paving breakers, hammers; hand tools, electric drills, saws and thousands of items of hand tools and factory and mill supplies.

**TRANSFORMERS**

(1) 7500KVA Wstghse 66000 Pri. 13800 Sec 3 PH 60 S/N 4089566 Yr. 1948
(1) 7500KVA Wstghse 66000 Pri. 2400 Sec 3 PH 60 S/N 4089567 Yr. 1948

Hundreds of transformers from KVA to 25 KVA

**MOTOR GENERATOR**

(1) 1250 KW GE 2300 Volt 270 Volt DC—750 RPM
(1) 1000 KW GE 2300 Volt AC 600 Volt DC—720 RPM
(1) 500 KW West 2300 Volt AC 275 Volt DC—720 RPM complete with controls, panels, etc.

**ROLLS—NEW & USED**

(11) 126″ x 34″—25″ Dia. x 20″
**NECKS—15′—4″ OAL**
(14) 126″ x 21″ 14″ Dia. x 19″
**NECKS—15′—4″ OAL**
(30) 89″ x 28″ Dia. x 18″
**NECKS—11′—11″ OAL**
(18) 89″ x 19″ 12″ Dia. x 20″
**NECKS—12′—9″ OAL**
(16) 66″ x 25½″ 23″ Dia. x 21″
**NECKS—10′—6″ OAL**
(15) 72″ x 28″ 18″ Dia. x 19″
**NECKS—10′—10″ OAL**
Cast Stl. Chilled Iron Coupling Boxes Etc.

**WELDERS**

Motor-Generator and Transformer Type 200-300-600-1200 Ampere Size Accessories—Cable, Clamps, electrode holders, welding rod.

Thousands of Mill items, new plate, structural, pipe, tubing, wire, cable, lockers, desks, fixtures, many items less than ten years old.

**OVERHEAD TRAVELING CRANES**

| | | | | |
|---|---|---|---|---|
| (1) | 150 Ton/40 Ton | Ladle Crane | Morgan | 55′— 6″ Span |
| (1) | 100 Ton/25 Ton | Ladle Crane | Wellman | 59′— 6″ Span |
| (1) | 40/25 Ton | Crane (1951) | Milwaukee | 56′— 6″ Span |
| (1) | 25 Ton | Crane (1949) | Milwaukee | 68′— 0″ Span |
| (1) | 20 Ton | Crane | Milwaukee | 69′— 4″ Span |
| (2) | 20/5 Ton | Crane | Shaw Box | 65′— 0″ Span |
| (1) | 20 Ton | Crane (1949) | Milwaukee | 46′—10″ Span |
| (1) | 15 Ton | Crane | Northern | 69′— 4″ Span |
| (2) | 15 Ton | Crane | Morgan | 64′— 6″ Span |
| (1) | 10 Ton | Crane | Alliance | 70′— 0″ Span |
| (1) | 10 Ton | Crane | P & H | 69′— 4″ Span |
| (1) | 10 Ton | Crane | Shaw Box | 69′— 4″ Span |
| (1) | 10 Ton | Crane | Shaw Box | 64′— 6″ Span |
| (1) | 10 Ton | Crane | Alliance | 64′— 6″ Span |
| (1) | 10 Ton | Crane | Milwaukee | 65′— 0″ Span |
| (2) | 10 Ton | Crane | Alliance | 60′— 0″ Span |
| (4) | 10 Ton | Crane | Alliance | 56′— 6″ Span |
| (1) | 5 Ton | Crane | Alliance | 64′— 6″ Span |
| (2) | 5 Ton | Crane | Alliance | 61′— 6″ Span |
| (1) | 5 Ton | Crane | Cleveland | 56′— 6″ Span |
| (1) | 5 Ton | Crane | Northern | 44′— 6″ Span |
| (2) | 5 Ton | Crane | Alliance | 40′— 4 ¼″ Span |
| (1) | 5 Ton | Crane | Phoenix Stl | 35′— 9″ Span |
| (1) | 15 Ton | Bridge Only (1949) | Milwaukee | 70′— 0″ Span |

*Write, Phone, Wire*

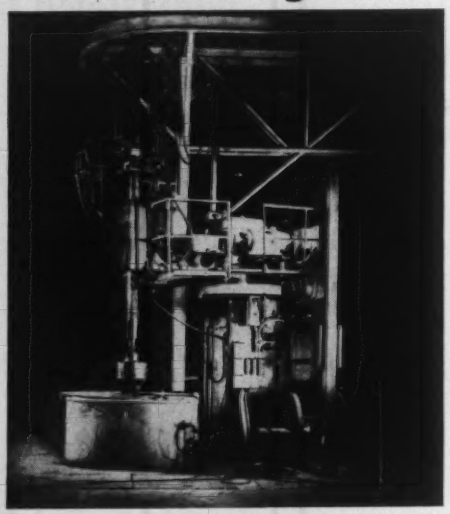
**LIPSETT Division LURIA BROTHERS & COMPANY, INC.**

**LIQUIDATION OFFICE**

915 South Front St., Harrisburg, Penna.—P.O. Box 1151
Phone CEdar 6-5988—Arnold Landesberg, Project Mgr.

## FOR SALE
# POT TYPE FURNACES
## For Heat Treating

At right is one of 12 electrically operated Rotary Pillar Jibs, 12 ft. to 18 ft. Reach 360 Degrees Radial Swing, equipped with 4,000# Hoist, shown servicing General Electric Lead Pots, 34" inside diameter x 60" deep using 165 kw per hour, 3 phase, 60 cycle, 220 volts, complete with radial hoist & rotating quench.



At left is one of 18 General Electric Pot Furnaces: 34" inside diameter x 60" deep, using 165 kw per hour, 3 phase, 60 cycle, 220 volts, for sale separately or complete with radial hoist and rotating quench. Pots all capable of handling stock up to 30" in diameter, complete with operating and temperature controls.

*WRITE FOR FREE CATALOGUE TODAY!*

- Machine Tools
- Forging Equipment
- Furnaces
- Heat Treating Accessories

**LURIA BROTHERS & CO., INC.**
**LURIA INDUSTRIAL DIVISION**
**EAST LEHIGH NAVAL ORDNANCE PLANT**
P. O. Box 1216-S Phone: University 5-0766 Bethlehem, Penna.

---

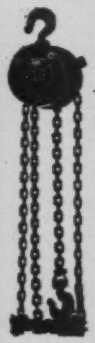
OFFERING
## BRIDGE CRANES
**ARNOLD HUGHES COMPANY**
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

---

## SALE OR RENT
45 & 65 Ton Diesel Electric Locomotives
25 & 40 Ton Diesel Locomotive Cranes
2—1000 K.W. Diesel Generator Sets, 2300 V—AC—direct connected to 16-278A GM Diesel Engines
B. M. WEISS COMPANY
Girard Trust Bldg. Philadelphia 2, Pa.

---

## CHAIN HOIST SPECIAL
New Elephant Triple Spur-Gear
MADE IN JAPAN



| SIZE | PRICE |
|---|---|
| ¼ ton | $ 45.00 |
| ½ ton | 50.00 |
| 1 ton | 65.00 |
| 1½ ton | 90.00 |
| 2 ton | 100.00 |
| 3 ton | 145.00 |
| 5 ton | 225.00 |
| 10 ton | 380.00 |

10 Ft. Lift
95% Efficiency

Jet Pullers—Link Chain

| SIZE | PRICE |
|---|---|
| ¾ ton | $ 46.50 |
| 1½ ton | 65.00 |
| 3 ton | 90.00 |
| 4½ ton | 160.00 |
| 6 ton | 190 00 |

F.O.B. Newburgh
Dealer inquiries invited
Distributor

**ORANGE COUNTY MACHY. CO.**
323 BROADWAY, NEWBURGH, N.Y.
JO 1-7333

---

## DEMPSTER-BALESTER
Model No. 350, Serial No. 400, with auxiliary compression door, skip pan loader, ejector cylinder and 75 H.P. electric motor. Can be inspected in operation on yard in Indiana.
**DEMPSTER BROTHERS, Inc.**
KNOXVILLE 17, TENN.

---

# CRANES
**BOUGHT & SOLD**
**ENGINEERED TO YOUR REQUIREMENTS**
## Ornitz Equipment Corp.
*Industrial Engineering Service*
595 Bergen St. Brooklyn 38, N. Y.
NEvins 8-3566

---

## 3000/4500 TON BLH HIGH SPEED FORGING PRESS NEW 1954
DIAMETER OF RAM 62"
STROKE OF RAM 40"
2—17" DIA PULLBACKS
MOVING DOWN TYPE
WITH INTENSIFIER
SN. S.O.520500-1-2-3
WT. 620,000#
FRACTION OF ORIGINAL COST
## POLLOCK INDUSTRIES INC.
S. KEIM ST., POTTSTOWN, PA. FA 3-5500

---

# HARCON-LIPSETT LIQUIDATING
## at 201 Rover St., Everett, Mass.
**500 TON/DAY BLAST FURNACE**
**108 KOPPERS COKE OVENS**
**2 PUSHER MACHINES**

### CARS
800 Cu. Ft. Larry 14'8" Ga. 230V. DC (2)
65 Ton Hot Metal Std. Ga. w/65 Ton Ladles (4)
50 Ton Slag Std. Ga. w/300 Cu. Ft. Ladles (2)
50 Ton Slag Std. Ga. w/260 Cu. Ft. Ladles (2)
50 Ton Transfer Std. Ga. 230V. DC
10 Ton Quenching Std. Ga. 41'6" Wheelbase

### OVERHEAD CRANES 230V. D.C.
110 Ton Cleveland Ladle 48'5" Span
20 Ton Shaw 41'7" Span, Cab Oper.
10 Ton Shaw 52' Span, Cab Oper.
10 Ton Bedford ¾ Yd. Bucket 61' Span

### ELECTRIC BRIDGE 230V. D.C.
Traveling on Rail, 230' Span, plus 80' Cantilever, 6 Ton Bucket, Single Trolley, Motor Driven

### MISCELLANEOUS
Penna. HAMMERMILLS SX13 400 HP (3)
Koppers 2 Roll CRUSHER 36"x42" 40 HP
Trimmer CONVEYOR 30"x13'3" c/c Cleated
100 Ton PRINTOMATIC Larry Car SCALE, 14'8" c/c Rail
50 Ton 60' Platform Printomatic TRUCK SCALE
30 Ton 40' Platform Printomatic TRUCK SCALE
CAR HAULS Drum Type 20"x18", 25 HP
SKIP HOIST Lidgerwood 178'
MOTORS, DC Type CO & MD Series & Compound Wound 230V. 1 to 200 HP (100)
MOTORS AC 3/60/440V. Squirrel Cage & Slip Ring 1 to 100 HP (100)

Representative on Premises DUnkirk 9-3380

Write for Catalog

SALES AGENT
## HEAT & POWER CO., INC.
60 E. 42 St., N. Y. MUrray Hill 7-5280

---

## FOR SALE OR RENT
1500 HP Alco-GE Diesel Electric Switcher locomotives. New 1949. Reconditioned. 6 available.
1000 HP EMD Diesel Electric Switcher Locomotive. Model NW-5. New 1947.
40 ton American #408 Diesel Loco. Crane. Cat. eng. Magnet generator. 1943.
25 ton Ind. Brownhoist #5 Diesel Loco. Crane. New 1942. Cat. engine.
45 and 25 Ton Gen. Elec. Diesel Elec. switching Locos. New 1944. Rebuilt.
50 ton Amer. 3046 Stiffleg Derrick and 200 HP Amer. #180 electric hoist.

## WHISLER EQUIPMENT CO.
1910 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

**PRECISION GROUND SHAFTING**

. . . is better and costs less when Universal supplies it.

*Request 16-page catalog* ▶

**UNIVERSAL GRINDING CORP.**
2200 Scranton Rd., Cleveland 13, O.

**FOR SALE**
**SURPLUS ELECTRICAL EQUIPMENT**
**MG SETS—AC and DC MILL DRIVES**
**DUQUESNE ELECTRIC & MFG. CO.**
6402 HAMILTON AVENUE
Pittsburgh 6, Pennsylvania

**COMPRESSORS**
**No better values at any price**

| | | | |
|---|---|---|---|
| 100 CFM | 150 psi | 6 x 7 Ing. | |
| 138 CFM | 100 psi | 7 x 7 Ing.—CPT—Worth. | |
| 183 CFM | 150 psi | 7 x 7 Joy WG9. | |
| 234 CFM | 100 psi | 9 x 9 Ing.—Worth Chic. Penn. | |
| 290 CFM | 75 psi | 10 x 9 Ing. ES-I | |
| 368 CFM | 100 psi | 12 x 10 Ch. Pn. NSB | |
| 465 CFM | 100 psi | 12 x 11 IR—Worth—CP | |
| 528 CFM | 100 psi | 14 x 12 Ing. Rand ERI | |
| 502 CFM | 125 psi | 12 x 13 Ing. Rand. Worth. | |
| 676 CFM | 110 psi | 15-9¼ x 12 IR-XRE. | |
| | 125 HP | Syn 3-60-440 | |
| 636 CFM | 100 psi | 14 x 13 IR. | |
| 805 CFM | 125 psi | 17-10 x 12 Ch. Pn. OCE. | |
| | 150 HP | 3-60-2300 Syn. | |
| 1020 CFM | 60 psi | 13-13 x 12. IR-XRE | |
| | 125 HP | Syn 3-60-220-IPF | |
| 877 CFM | 125 psi | 17/10½ x 14—IR—XRB. | |
| 2200 CFM | 110 psi | 26-15 x 18 CP—OCE | |
| | 350 HP | Syn 3-60-4160 | |
| 1855 CFM | 110 psi | 23-14 x 14 Ing. XRE | |
| | 300 HP | G.E. Syn 3-60-440 (2) | |

Portable Gas-diesel 60"-600'.

**AMERICAN AIR COMPRESSOR CORP.**
DELL AND IRON STREETS
NORTH BERGEN, N. J.
Telephone UNion 5-4848

**FOR SALE**
**LOCOMOTIVE CRANE**
**American** (Series 830 CD), 30-Ton, Diesel Built new 1954, Equipped with Caterpillar D-13000 engine, Generator and Magnet, Pneumatic controls, Heated cab, Windshield wipers, Air horn, Safety glass, Outriggers
**Excellent Condition**
**Priced for quick sale by owner**
**BOX H-189**
**c/o IRON AGE**
**Chestnut at 56th Sts.**
**Philadelphia 39**

**RR CARS, LOCOMOTIVES, CRANES**
25 & 50 Ton Amer. Loco. Cranes
100—70 ton cap. Covered Hopper Cars
400—50 ton cap. Coal & Ore Hopper Cars
28—Diesel Elec. Locomotives 25, 45, 65, 70, 80, 100 & 115 ton G.E., GM & Alcoa
**STANHOPE, 60 E. 42nd St., N.Y. 17, N.Y.**

30 Ton Ohio Diesel Locomotive Cranes, excellent condition, $16,950, Terms & Rentals. Orton, Americans available also. BARGAINS. 45 T. G.E., Whitcomb Diesel Elec. Locomotives.
**EVEREADY**
BOX 1780, Bridgeport, Conn.
EDison 4-9471-2

**PRESSES**
**BRAKES SHEARS**
*Will Lease or Furnish Long Terms*
JOSEPH HYMAN & SONS
2600 E. Tioga St., Philadelphia 34, Pa.

**LIFTING MAGNETS**
A complete magnet service. Magnets, new & rebuilt, generators, controllers, reels, etc.
*Magnet specialists since 1910*
**Goodman Electric Machinery Co.**
1060 Broad St. Newark 2, N. J.


## EMPLOYMENT EXCHANGE

### Help Wanted


**SALES ENGINEER**
Excellent opportunity for right man with growth company. Submit complete resume with salary requirements.
**Box H-188**
**c/o The IRON AGE, Chestnut at 56th, Phila. 39**


TECHNICAL SALES-SERVICE MAN, Midwest refractory manufacturer needs young man, with technical background, 5 years' experience in Open Hearth or Electric Furnace shop, to sell and service refractory products for steelmakers in Midwest and South. Good future prospects in expanding business. Give salary requirements and complete resume. Replies held confidential. Box H-181, c/o IRON AGE, Chestnut at 56th, Phila. 39.

### Employment Service

HIGH GRADE MEN — Salaries $5,000 to $25,000. Since 1915 thousands of Manufacturing Executives, Engineers, Sales Managers, Comptrollers, Accountants and other men of equal calibre have used successfully our confidential service in presenting their qualifications to employers. We handle all negotiations. Submit record with inquiry. The National Business Bourse, 220 South State Street, Chicago 4, Illinois.


**SPECIALTY STEEL SALES PRODUCT MANAGER**

**An outstanding opportunity exists for a man having broad experience and knowledge of the specialty-steel rod, bar, and billet market. The successful applicant must have superior technical sales background and be capable of taking complete charge of rod, bar and billet sales in titanium, stainless and specialty steels.**

**This opportunity is with a nationally integrated metals producer whose rapid growth offers unlimited opportunities for advancement.**

**Salary open, commensurate with experience and ability. Submit complete details regarding education and experience to:**

Sales Manager
Harvey Aluminum
**19200 South Western Avenue**
**Torrance, California**


## EQUIPMENT AND MATERIALS WANTED


**WANTED**
**BRIDGE CRANES**
**ARNOLD HUGHES COMPANY**
2765 PENOBSCOT BLDG. DETROIT, MICH.
WOodward 1-1894

**MACHINERY WANTED**
good used wire drawing machine ¼" capacity, having 6 or 7 draw blocks
Cavaler Spring Company Inc.
7924 Riopelle St., Detroit 11, Mich.

**WEISS STEEL CO. INC.**
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS
*Buyers of Surplus Steel Inventories*
39 Years of Steel Service

**WANTED**
**SURPLUS STEEL**
**WALLACK BROTHERS**
7400 S. Dames Ave. Chicago 36, Illinois
GROVEHILL 6-7474

**SURPLUS STEEL**
**NEW** *WANTED* **USED**
*Structurals, Plate, Pipe and Tubing*
*Consumers Steel & Supply Co.*
P. O. Box 270, RACINE, WISCONSIN

WANTED TO PURCHASE—any quantity
**CARBON—ALLOY—STAINLESS**
Bars—Billets—Sheet—Plate
**THE GILBERT MERRILL STEEL CORP.**
91 New York Ave., Westbury, L. I., N. Y.
EDgewood 3-7300

## ADVERTISERS IN THIS ISSUE

**An asterisk indicates that a booklet, or other information, is offered in the advertisement.**

**This index is published as a convenience. No liability is assumed for errors or omissions.**


A

Alan Wood Steel Co. ..... 152
*Allegheny Ludlum Steel Corp. . 94
Allis-Chalmers ..... 38-39
*All-State Welding Alloys Co., Inc. ..... 136
American Air Compressor Corp. 173
*American Gas Furnace Co. .... 138
American Metallurgical Products Co., Inc. ..... 65
*American Optical Co. ..... 36
*American Smelting & Refining Co., Federated Metals Div. ... 37
*American Welding & Mfg. Co. 118
Anaconda American Brass Co. .. 8
Arcos Corp. ..... 140-141
*Armstrong-Blum Manufacturing Co. ..... 63
*Armstrong Bros. Tool Co. ..... 136
*Arwood Corp. ..... 54-55
Atlas Car & Mfg. Co. ..... 143

B

Baldt Anchor, Chain & Forge Div. 174
Barber-Colman Co. ..... 42-43
Belyea Co., Inc. ..... 170
Beryllium Corp. ..... 51
Bethlehem Steel Co. ..... 1
Branson Instruments, Inc. ..... 142
Broderick & Bascom Rope Co. .. 85
*Bullard, E. D., Co. ..... 176

C

Carborundum Co. ..... 90
Carco Industries, Inc. ..... 174
Carlstrom Pressed Metal Co..... 174
Carpenter Steel Co. ..... 61
Cavaler Spring Co. ..... 173
*Celanese Chemical Co. .....26-27
Chicago Pneumatic Tool Co. ..52-53
*Chromalloy Corp. ..... 23
Colorado Fuel & Iron Corp. ...66-67
*Conco Engineering Works, Inc. . 121
Consumers Steel & Supply Co. .. 174
*Copperweld Steel Co., Aristoloy Steel Div. .....Inside Front Cover
Copperweld Steel Co., Ohio Seamless Tube Div. ..... 25
Crucible Steel Co. of America..30, 45
*Cullen-Friestedt Co. ..... 150
Curry & Hudson Assoc., Inc. ... 170
Curtiss-Wright Corp., Princeton Div. ..... 167

D

Dempster Brothers, Inc. ..... 172
*Drop Forging Association ..... 41
Duquesne Electric & Mfg. Co. .. 173
Duraloy Co. ..... 146

E

Electro Lift, Inc. ..... 167
Erie Forge & Steel Corp. ..... 83
*Euclid Electric & Mfg. Co. ..... 175
Eveready Supply Co. ..... .. 173

F

Federal-Mogul Service Div. Federal-Mogul-Bower Bearings Inc. 92
*Federated Metals, Div. American Smelting & Refining Co. .. 37
*Foxboro Co. ..... 22
Fuji Iron & Steel Co., Ltd. ..... 34

G

*General Electric Co. .....130-131
Gilbert Merrill Steel Corp. ..... 173
Goodman Electric Machinery Co. 173
Goodyear Tire & Rubber Co., Industrial Products Div. .....28-29
Goss & DeLeeuw Machine Co. .. 175
Greist Manufacturing Co. ..... 174

H

Harvey Aluminum ..... 173
*Hayes, C. I., Inc. ..... 19
Hooker Chemical Corp. ..... 64
Hughes, Arnold, Co. .....172, 173
Hyde Park Foundry & Machine Co. ..... 124
Hyman, Joseph, & Sons..... 173


## CONTRACT MANUFACTURING


**THE FORMULA:**
Multi-operation presses
plus
Yankee skilled workmen
over
Eighty years manufacturing
know-how equals
Low cost metal stampings
And precision assemblies
To meet your needs
**The GREIST MANUFACTURING CO.**
646 Blake St., New Haven 15, Conn.

**METAL STAMPINGS**
Send your blueprints for our prompt quotation. Latest brochure sent upon request.
CARLSTROM PRESSED METAL CO., INC.
58 Fisher Street Westboro, Mass

Gray Iron and Semi Steel Castings, also alloyed with nickel, chrome, and molybdenum. Pattern work.
**KING FOUNDRIES, INC.**
Phone OX-9-4823 North Wales, Montg. Co., Pa.
25 Miles from Philadelphia, Pennsylvania

**DROP FORGINGS**
To Your Specifications
Prompt Quotations
BALDT ANCHOR CHAIN & FORGE DIVISION
P. O. Box 350—Chester, Pennsylvania

K
SINCE 1895
**DROP FORGINGS**
*Small drop forgings up to one pound in size. Inquiries invited for very prompt action.*
**KEYSTONE FORGING COMPANY**
Northumberland Pennsylvania GReenwood 3-3525

**SPECIFY MEEHANITE® CASTINGS FOR MAXIMUM SERVICE**
SPECIAL TYPES FOR RESISTANCE TO ABRASION • HEAT • WEAR • CORROSION AS CAST OR MACHINED.
Weights: 1—60,000 lbs.
ROSEDALE
FOUNDRY & MACHINE CO.
1731 Preble Avenue • Pittsburgh 33, Pa.
Telephone: CEdar 1-4007

**SPECIAL MACHINERY**
DIAMITE *Abrasive Resistant* Castings
NI-RESIST *Heat & Corrosion Resistant* Castings
P M G BRONZE *High Strength Acid Resistant* Castings
Fully Equipped—Pattern Foundry & Machine Shop Facilities—Castings to 15 tons
Weatherly Foundry & Mfg. Co., Weatherly, Pa.

**STAMPINGS — WASHERS**
Short Runs All Metals Long Runs
All tools produced in our own tool rooms. Press capacities up to 500 tons.
THOMAS SMITH COMPANY
294 Grove St., Worcester 5, Mass.

**DROP FORGINGS**
Special Forgings of Every Description. We solicit your prints or model for quotation.
**Wilcox Forging Corporation**
Mechanicsburg Penna.

Nepsco
**NEW ENGLAND PRESSED STEEL COMPANY**
*Contract Manufacturer since 1914*
METAL STAMPINGS
SPECIALTIES—APPLIANCES
*For Industrial and Domestic Users*
P. O. BOX 29
NATICK MASSACHUSETTS

**DROP FORGINGS**
Special Forgings—High Quality, Fast Delivery. For prompt attention phone or send prints to John Bello.
**CARCO INDUSTRIES, INC.**
7341 Tulip Street, Phila. 35, Pa.
DEvonshire 2-1200

I

Industrial Distributors, Ltd. ....32-33
Inland Steel Co. .....144-145

K

*Kemp, C. M. Mfg. Co. ..... 60
Keystone Forging Co. ..... 174
Keystone Steel & Wire Co. ..... 137
King Foundries, Inc. ..... 174

L

Lamina Dies & Tools, Inc. ..... 100
*Lamson Corp. .....134-135
*Lodge & Shipley Co. ..... 133
Luria Bros. & Co., Inc. .....171-172

M

*McKay Machine Co. .....96-97
*Mac Whyte Co. ..... 62
*Meehanite Metal Corp. ..... 123
*Metalskin Corp. ..... 176
Midvale-Heppenstall Co. ..... 102
Miller, Harry, Corp. ..... 12
Minnesota Mining & Mfg. Co. Industrial Tape .....147, 149, 151
Minster Machine Co. ..... 10
Mitsubishi Shipbuilding & Engineering Co. Ltd. ..... 40
*Mobil Oil Co., Div., Socony Mobil Oil Co., Inc. .....127-129

N

National Business Bourse, Inc..... 173
New Britain-Gridley Machine Div. New Britain Machine Co. ....17-18
New Britain Machine Co.....17-18
New England High Carbon Wire Corp. ..... 148
New England Pressed Steel Co... 174

O

Ohio Seamless Tube, Div. Copperweld Steel Co. ..... 25
Orange County Machinery, Inc. 172
Ornitz Equipment Corp. ..... 172

P

Parker Rust Proof Co. ..... 56
Peterson Steels, Inc. ..... 157
Pollock Engineering Co., Inc. ... 21
Pollock Industries, Inc. ..... ... 172
Powermatic Mch. Co. ..... 155

R

*Ransburg Electro-Coating Corp. 24
Research-Cottrell, Inc. ..... 31
C. A. Roberts Co. ..... 126
*Rodney Metals, Inc. ..... 57
Rosedale Foundry & Machine Co. 174
Ryerson, Jos. T. & Son, Inc. .... 14

S

Shell Oil Co. ..... 117
*Signode Steel Strapping Co. Back Cover
Silent Hoist & Crane Co. ..... 139
Simonds Saw & Steel Co. ..... 88
Smith, Thomas Co. ..... 174
Spaulding Fibre Co., Inc..... 48
Stanhope, R. C. Inc. ..... 173
*State of Ohio, Dept. of Industrial & Economic Development 16

T

*Taylor Fibre Co. .....98-99
Timken Roller Bearing Co. ..... 86
*Trabon Engineering Corp. Inside Back Cover
Treadwell Engineering Co. ..... 6
*Trent Tube Co. Subsidiary Crucible Steel Co. of America ... 30
*Turco Products, Inc. ..... 125

U

Udylite Corp. ..... 44
United Engineering & Foundry Co. ..... 69
United States Steel Corp. ..... 46
Universal Atlas Cement Div. United States Steel Corp. ..... 46
Universal Grinding Corp. ..... 173

V

Valley Mould & Iron Corp. ..... 20
Vascoloy-Ramet Corp. ..... 58
Voss Engineering Co. ..... 138

W

Wallack Bros. ..... 173
Ward Steel Co. ..... 124
*Warner & Swasey Co. ..... 4
*Wean Equipment Corp. ..... 59
Weatherly Foundry & Mfg. So.... 174
Weiss, B. M., Co..... 172
Weiss Steel Co., Inc..... 173
Westinghouse Electric Corp. ...47-50
Wheland Co. ..... 70
Whisler Equipment Co. ..... 172
*Whiting Corp. ..... .. 35
Wickwire Spencer Steel Div. Colorado Fuel & Iron Corp 66-67
Wilcox Forging Corp. ..... 174

Z

Zak Machine Works, Inc. ..... 150

CLASSIFIED SECTION

Clearing House .....170-173
Contract Manufacting ..... 174
Employment Exchange ..... 173
Equipment & Materials Wanted.. 173

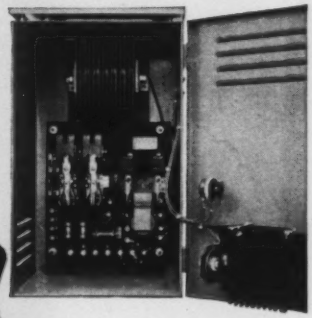


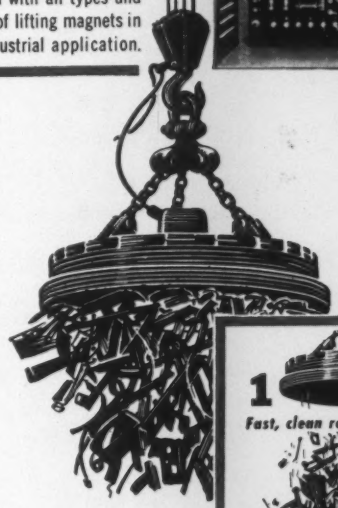
**GOSS and DE LEEUW**
MULTIPLE SPINDLE
**CHUCKING MACHINES**
*Tool Rotating*
GOSS & DE LEEUW MACHINE CO., KENSINGTON, CONN

**EUCLID**

**LIFTING MAGNET CONTROLLERS PROVIDE 3-WAY RELEASE • • •**

The Euclid Bulletin 4290 automatic discharge type magnet controller is the only one on the market today that will assure fast and clean release of full load, accurate release of partial load and precise control of dribbling. It can be used with all types and makes of lifting magnets in any industrial application.





***CUSTOM ENGINEERING IS OUR BUSINESS***

We specialize in designing the control system best suited to your individual needs. Our services are yours for the asking. WHAT'S YOUR PROBLEM?

*Ask for Bulletin 4290*

EX-27

The EUCLID Electric & Mfg. Co.
Dept. A • MADISON • OHIO

# METALSKIN®

*the first complete protection for polished metal surfaces from the steel mill to the ultimate consumer*

A new breakthrough for the protection of highly polished metals . . . Metal Skin transparent polymer film. Offering unlimited advantages at all levels Metal Skin is easily and automatically rolled on "in-line" and can be imprinted with your advertising message simultaneously.

**ONLY METAL SKIN OFFERS SO MUCH**

- Constant visual inspection - eliminates fabricated rejects.
- Complete protection for metals during stamping, bending, forming and drawing.
- "Stays on" until removed by consumer — PEELS OFF IN SECONDS!
- Ends special cleaning, shopwear — never leaves residue.
- Costs less than any other contact protection material.

® Reg. Tdmk. Pat. Pending

*Write or Call for Complete Technical Information*

**METALSKIN** *corporation*

3 Tenafly Road Englewood, New Jersey, LOwell 7-6677

Bullard TIP-LOCK Safety hoist hooks lock loads in and protect men and materials. So rugged and simple, they will operate for years with practically no maintenance ...yet the TIP-LOCK hook is made with such precision that a touch of the finger opens the gate. In sizes 6 (5,500 lbs.) through 18 (100,000 lbs.) to fit all makes and models of hoists, cranes and derricks.

**BULLARD**
INDUSTRIAL SAFETY EQUIPMENT

*Write for Tip-Lock Safety Hoist Hook Data Sheet*

**E. D. BULLARD CO.**
SAUSALITO, CALIFORNIA

# TRABON®

## CENTRALIZED LUBRICATING SYSTEMS

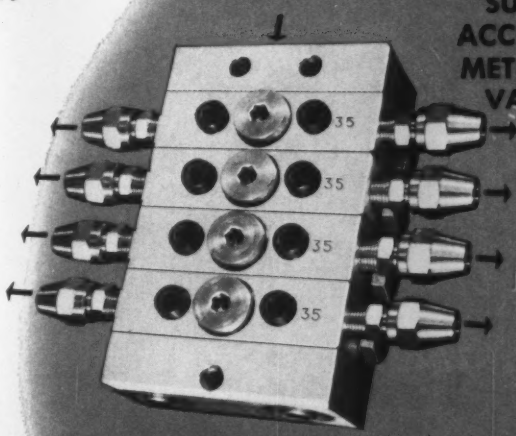
# Introducing the PLUS + POSITIVE

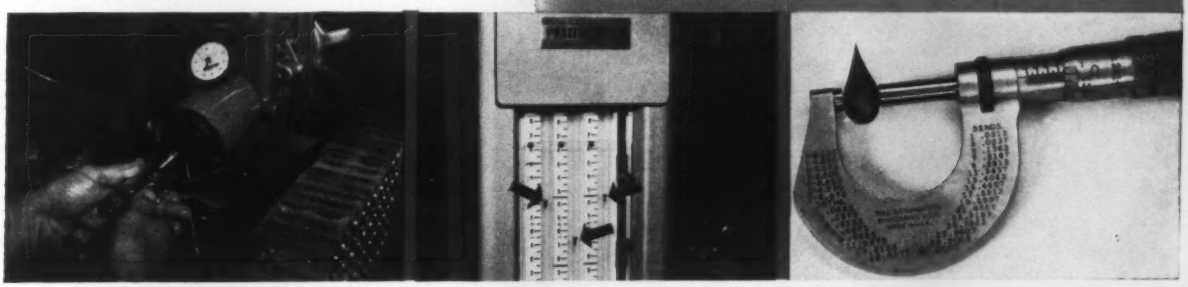
An improvement in Centralized Lubrication—

far better than anything offered before

- PRECISE METERING OF LUBRICANT—from drops to .300 cu. in.
- CENTRAL WARNING SIGNAL—for broken line* or blockage anywhere in system.
- BUILT-IN CHECK VALVES—assures positive error-proof operation.
- SHORTER—FULL-FLOW PASSAGES—for minimum pressure drop . . . maximum lubricant flow.
- NEW 3-LOBED PISTON DOUBLES SEALING AREA.

**Write for more information on Trabon's new Broken Line Indicator—the all-hydraulic (non-electric) central-signalling warning device.*



**Precision machining + Micro-accurate gauging = "Plus Positive" Metering**

Individual "Match-honing" of Cylinders to fit each 3-lobed piston provides superior sealing—accurate metering.

Super-precision air gauges maintain match-honed piston-cylinder fits to tenths of thousandths of an inch.

All bearings receive exact force-fed amounts of lubricant. No skipping or under or over lubrication for *any* bearing.

PLUS + POSITIVE "*Centralized*" OIL AND GREASE SYSTEMS "*Meterflo*" CIRCULATING OIL SYSTEMS "*Meter-Mist*" OIL SYSTEMS

Trabon® **Trabon Engineering Corporation** 28815 Aurora Road • Solon 39, Ohio

## Production line strapping of tin plate coils

Packaging of tin plate coils is now on a production line basis in speed and low cost. Fast, dependable Signode air power tools take ¾″ and 1¼″ steel strapping from the dispenser, eliminating the waste of cut-to-length strap. Overhead tool suspension systems and engineered dispensers add mobility and save more time and effort. Engineered installations by Signode save time and money. Write for more information. Ask for free copy of "Air Power Tensioners and Sealers."

*First in steel strapping*

**SIGNODE STEEL STRAPPING CO.**

2623 N. Western Avenue, Chicago 47, Illinois

Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto